RElIAS

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**Clients' Technical Assistance Service**

# MC 14 - Electric printing calculators

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ADVANCED BUSINESS MACHINES
230 RANDOLPH ROAD
FREEHOLD N.J. 07728-1535
1-732-431-1464

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# FOREWORD

## Machines with old type accumulator.

Up to serial number 415300 for Elettrosumma, 515999 for Multisumma and 821599 for Divisumma, the MC 14 machines have been provided with an accumulator which made a rotation of 180° to go from the « addition » position to the « subtraction » one and vice versa.

The first part of this booklet gives the instruction for assembling the MC 14 furnished with this accumulator. The descriptions are divided into progressively numbered paragraphs; some are applicable to all three models, Multisumma, Elettrosumma and Divisumma while others are sub-divided according to the model to be mounted.

## Machines with new type accumulator.

Beginning with serial number 415301 for Elettrosumma, 516000 for Multisumma and 821600 for Divisumma, the MC 14 machines have been provided with an accumulator which rotates through only 36° to go from the « addition » position to the « subtraction » one and vice versa.

For assembling these types of machine the instructions given for assembling the MC 14 with 180° accumulator (first part) should be followed; the paragraphs marked with an asterisk should be disregarded as these apply exclusively to the MC 14 180° accumulator. The paragraphs applicable to the assembly of the MC 14 with 36° accumulator will be found in the second part of the book.

N.B. - No instructions for the assembly of the MC 14 M with 36° accumulator have been given. Only about a thousand of these models were assembled and latterly the production has been limited to Elettrosummas and Divisummas.

**IMPORTANT:** Right and left are always used to mean when viewing the machine from in front, i.e. with the keyboard towards the operator. The back is the part where the carriage is, the front where the keyboard is. Distances for adjustments are expressed in millimeters.

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# PART ONE

# Instructions for Assembly and Adjustment

MC 14 D - M - E (180° accumulator)

## •1 - Preparing the base casting.

### MC 14 D - M - E (Figures 1 and 1a)

*a*) Attach the rubber feet N3 A 118 on the two leaf springs N3 GA 16 (figure 1a) with the nuts 138305 placing their plates N3 A 25 in between.

*b*) Secure the leaf spring, now prepared, to the base casting N3 A 1, with collar screws 1264011.

*c*) Screw the four iron feet UA 8202 to the base casting with the washers 40352 under them.

*d*) Attach the two spring holding plates N3 H 45 to the base with screws 120352.

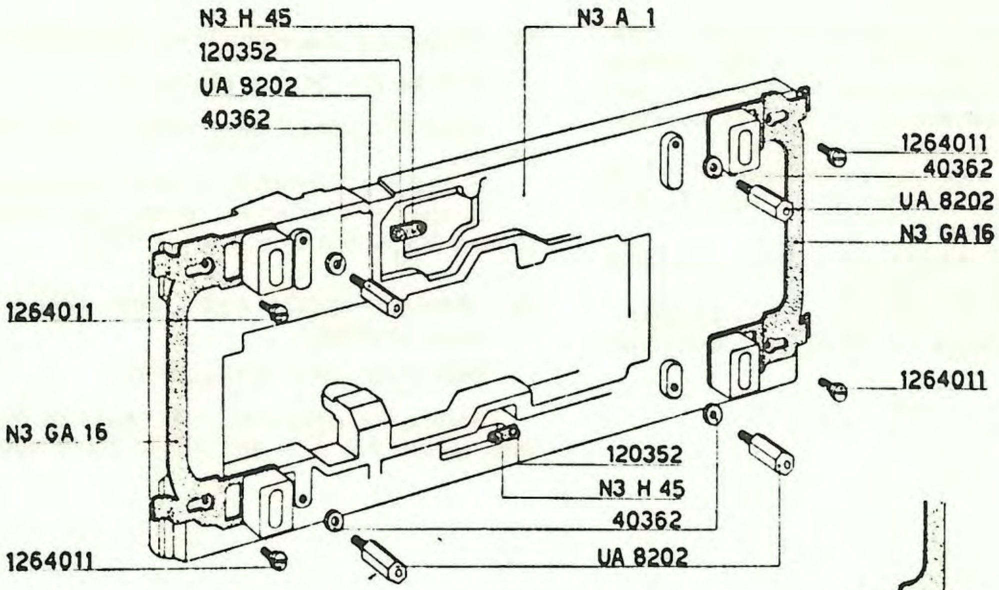

N3 H 45
120352
UA 8202
40362
N3 A 1
1264011
40362
UA 8202
N3 GA 16
1264011
N3 GA 16
1264011
120352
N3 H 45
40362
1264011
UA 8202

fig. 1

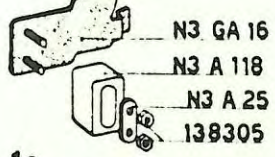

N3 GA 16
N3 A 118
N3 A 25
138305

fig. 1a

## *2 - Preparing the left inner side frame N3 EA 3.

MC 14 D - M - E (Figure 2)

Place in position on the left inner side frame N3 EA 3:

*a*) the left bracket for clamping the keyboard N3 A 13 with two screws 120302;

*b*) the negative balance unit N3 EF 4 with the screw 120307, the special screw N3 F 10 placing the distance collars 40313 in between. The two screws should be partially screwed down. Hook the spring N3 F 14 between the levers of the unit as shown in the figure 1;

*c*) the eccentric for stopping accumulator N2 F 18 with the distance piece for the control rod N3 F 7. The N2 F 18 should not be locked;

*d*) the left inner and outer side frames connection column N3 A 6 with the nut 138405;

*e*) the bracket N3 A 24 with two screws 120303;

*f*) the two special screws N3 D 27 with their two nuts 138305.

## *3 - Assembling the left inner side frame on the base casting.

MC 14 D - M - E (Figure 2)

Secure the inner left side frame on the base casting with two screws N3 A 9 and nuts 138505.

## *4 - Preparing the right inner side frame N3 EA 104.

MC 14 D - M - E (Figure 3)

Place in position on the right inner side frame N3 EA 104:

*a*) the bracket N3 A 10 with two screws 120303;

*b*) the right inner and outer side frames connecting column N3 A 7 with the nut 138405.

## *5 - Assembling the right inner side frame on the base casting.

MC 14 D - M - E (Figure 3)

Secure the right inner side frame to the base casting with screws N3 A 8, and N3 A 9 and nuts 138505.

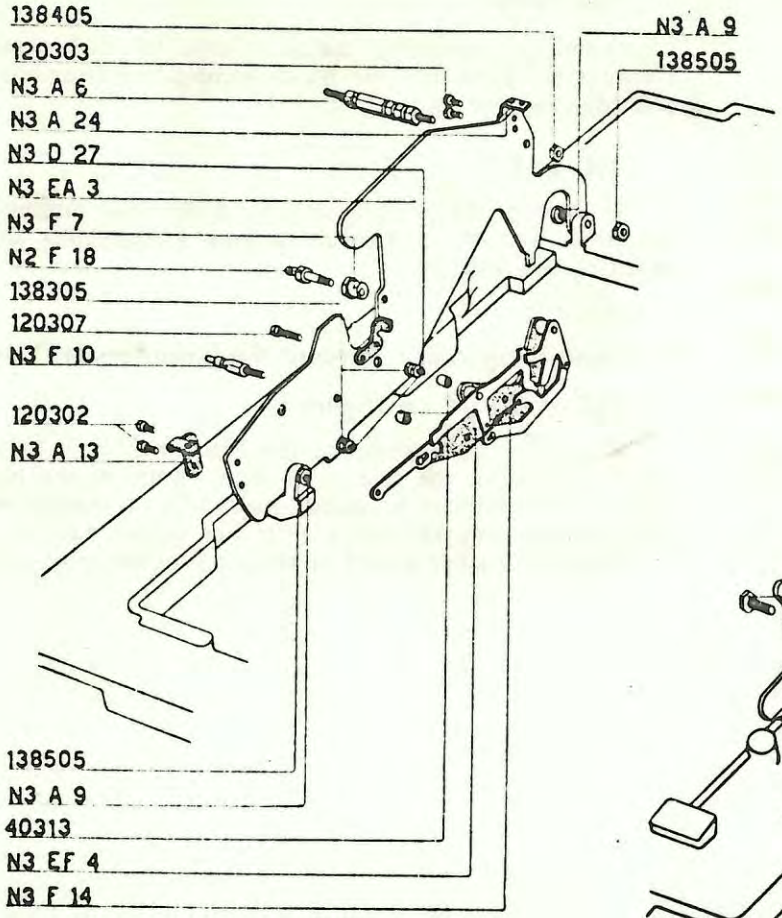

138405
120303
N3 A 6
N3 A 24
N3 D 27
N3 EA 3
N3 F 7
N2 F 18
138305
120307
N3 F 10
120302
N3 A 13
N3 A 9
138505
138505
N3 A 9
40313
N3 EF 4
N3 F 14

fig. 2

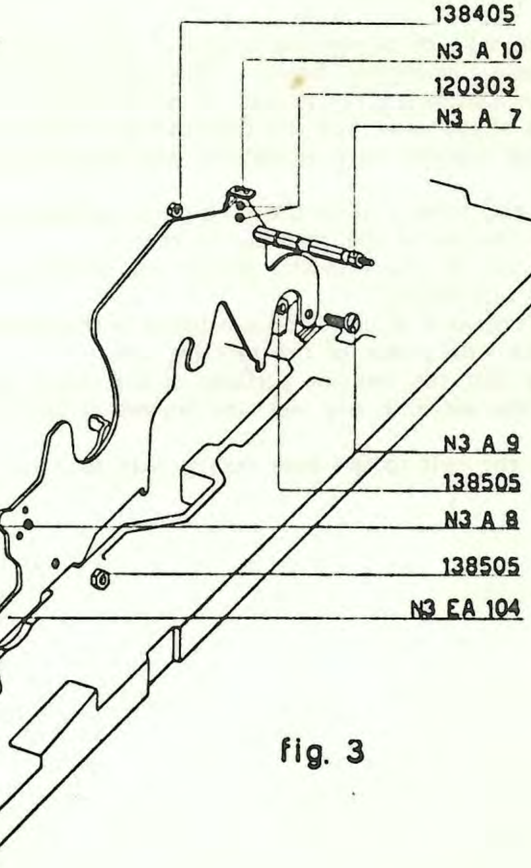

138405
N3 A 10
120303
N3 A 7
N3 A 9
138505
N3 A 8
138505
N3 EA 104

fig. 3

## •6 - Assembling the print unit.

### MC 14 D (Figure 4)

For the sake of clarity the whole of the print unit has not been completely drawn. One single chain of printing mechanism is given in diagram form between the side frames of the unit. For the composition of the unit, refer to the chapter on « assembling and adjusting the units ».

Lodge the print unit of the divisumma between the inner sides frames of the machine so that:

*a*) the pin **A** goes into the proper slot of the right hand inner side frame;

*b*) the tenons **T** of the two sides lodge in the notches made in the side pieces of the printing unit.

Ensure that the interior surfaces of the inner side frames of the machine and the side frames of the unit are flush.

Clamp the unit to the base casting with four screws 120402.

### MC 14 M

Instead of mounting the print unit for divisumma, assemble the print unit for multisumma (see « assembling and adjusting the units »).

### MC 14 E

In place of the printing unit for divisumma, assemble the print unit for elettrosumma (see « assembling and adjusting the units »).

## 7 - Assembling upper comb of the hammers N3 T 14.

### MC 14 D - M - E (Figure 5)

Place the upper comb of the hammers N3 T 14 in position between the two inner side frames of the machine. The hammers must be inserted in the respective guide slots; clamp the comb with four screws 120304.

Place the washer 403619 on the pin **A** of the print unit.

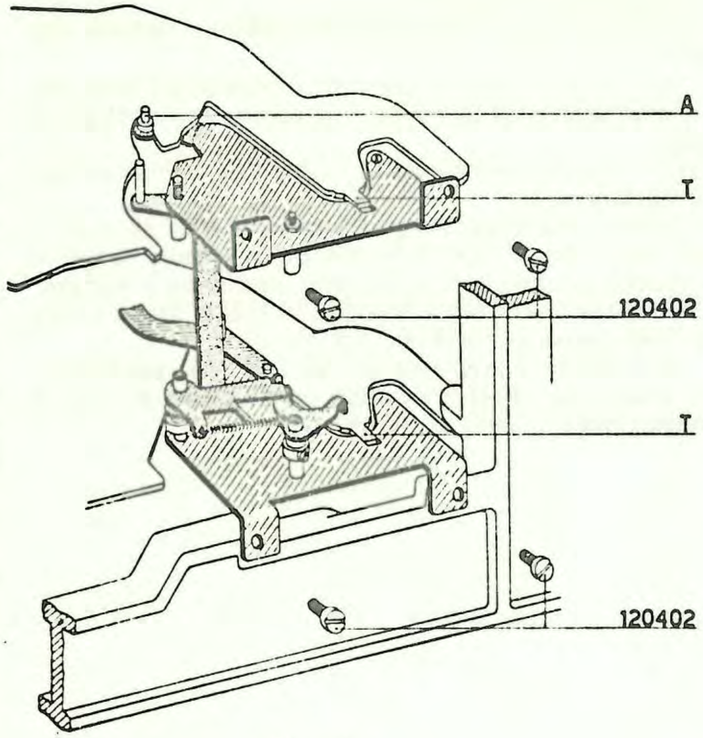


fig. 4

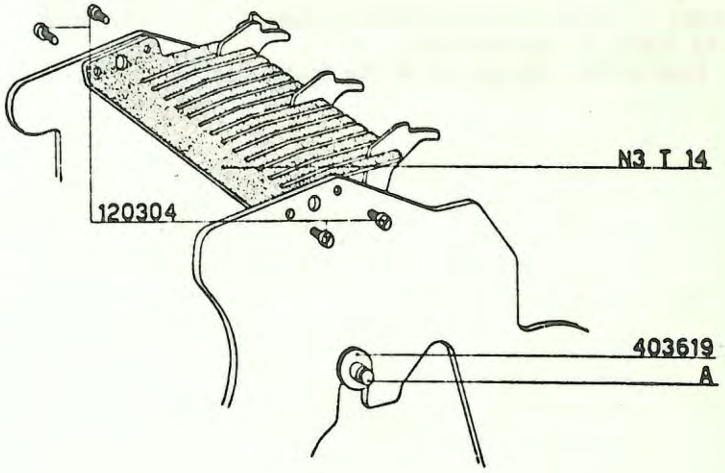


fig. 5

## 8 - Assembling the hammer stopping frame and the corresponding control.

### MC 14 D - M - E (Figures 6 and 6a)

*a*) Assemble the line spacing control lever N3 ET 36 at the right end of the shaft N3 T 39; secure it with two screws 122302 which should be lightly screwed in, not locked.

*b*) Introduce the shaft N3 T 39 into the appropriate hole in the right inner side frame of the machine. Place the hammer stopping frame N3 Q 98 with its spring N3 T 41 on the shaft. Hook the spring to the frame and charge it for a half turn. Advance the shaft further and insert it into the corresponding hole in the left inner side frame of the machine.

Ensure that the pin **P** of the frame N3 GT 135 is in the position shown in figure 6a in respect of the hammer stopping frame N3 Q 98.

*c*) Secure the shaft N3 T 39 with the flexible clip 45361.

*d*) The axial play of the shaft should be 0.2 mm; this condition is reached by moving the control lever N3 ET 36 axially.

When the required condition is obtained, tighten screws 122302 thoroughly.

*e*) Place the line spacing control lever N3 T 38 in position; the pivot of the lever N3 ET 36 should lodge in its upper slot; the pin **A** of the print unit in the lower slot.

Secure the lever with a flexible clip 45221. Hook spring N3 T 43 between N3 T 38 and N3 ET 36.

*f*) Place the non-print hook N3 GT 116 in position on the small shaft **B** of the print unit; secure it with a hexagon head bushing N N 18.

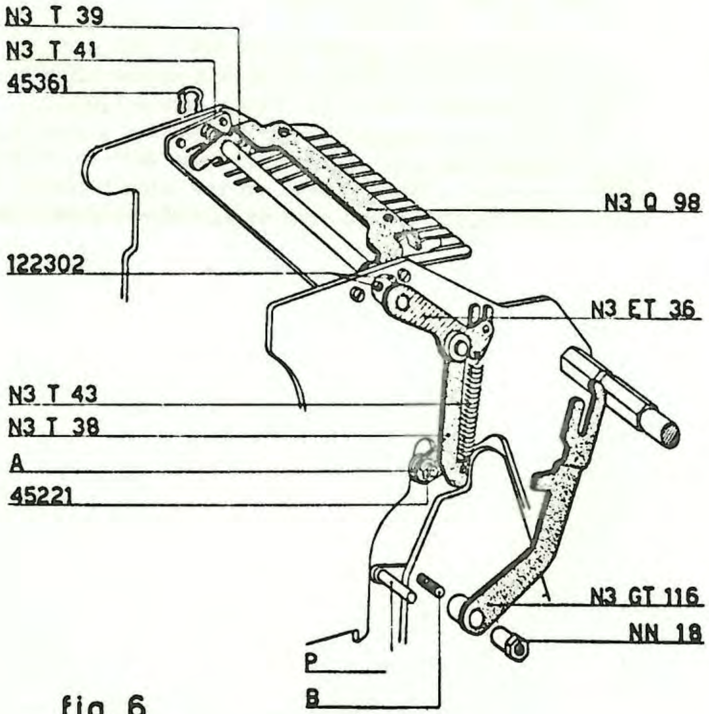

N3 T 39
N3 T 41
45361
N3 Q 98
122302
N3 ET 36
N3 T 43
N3 T 38
A
45221
N3 GT 116
NN 18
P
B

fig. 6

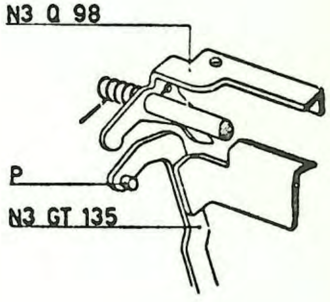

N3 Q 98
P
N3 GT 135

fig. 6a

## *9 - Preparation and assembling the lower guide comb for the vertical type carrying racks.

### MC 14 D (Figure 7)

*a*) On the lower guide comb N3 T 24 place:
— the right bracket N3 A 12 with a screw 120302;
— the left bracket N3 A 11 with a screw 1253010, placing the spring washer 44332 in between.

*b*) Place the prepared unit in position between the inner sides of the machine and clamp it:
— on the left side with two screws 120303 placing washers 40312 in between;
— on the right side with two screws 120303, placing a washer 40312 under the back screw only.

The four screws 120303 should only be partially screwed down.

### MC 14 M - E (Figure 8)

*a*) On the lower guide comb N3 T 24 place:
— the right bracket N3 A 12 with a screw 120302;
— the left bracket N3 A 11 with a screw 120302.

*b*) Place the prepared unit in position between the inner sides of the machine and clamp it with four screws 120303, putting washers 40312 on the back screws. The four screws 120303 should only be partially screwed down.

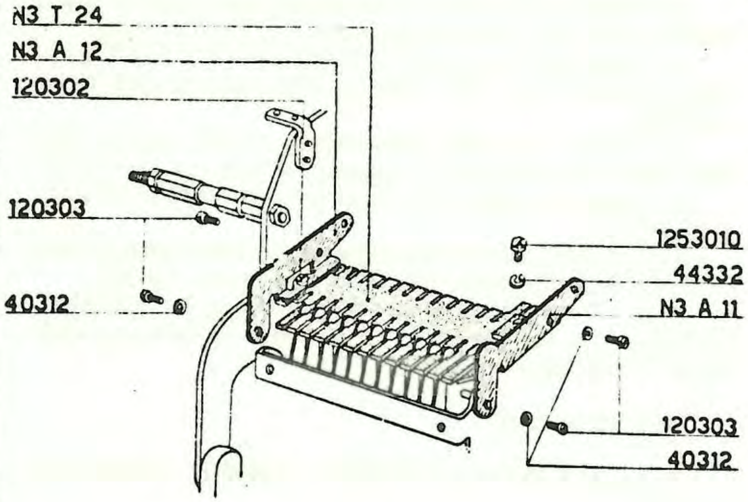

N3 T 24
N3 A 12
120302
120303
40312
1253010
44332
N3 A 11
120303
40312

fig. 7

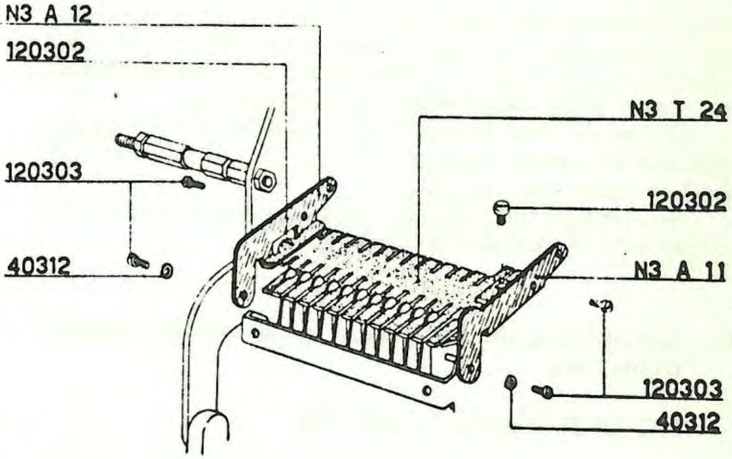

N3 A 12
120302
120303
40312
N3 T 24
120302
N3 A 11
120303
40312

fig. 8

## 10 - Assembling the universal bar.

### MC 14 D - M - E (Figure 9)

Insert the shaft N3 R 2 for the arms of the universal bar in the bushing of the right inner side frame of the machine. Lodge the right arm N3 GR 14 and the left arm N3 ER 8 on the shaft. Ensure that the left arm is placed between the left side and the bracket of the negative balance unit. Put the universal bar N3 R 7 in place between the two arms. The shaft N3 R 2 should project the width of its bevel from the left bushing.

Clamp the two arms N3 ER 8 and N3 GR 14 to the shaft N3 R 2 with the screws N3 R 15. Allow the shaft itself an axial play of 0.2 mm.

Be sure that the universal bar N3 R 7 is perpendicular to the side frames of the machine.

## 11 - Assembling the horizontal racks and the special signs rack.

### MC 14 D (Figures 10 and 10a)

Nine of the eleven horizontal racks are indentical but:

— the first rack on the right N3 AQ 4 has, in addition, the pin **A** (figure 10a) which controls the automatic interruption of division;

— the last rack on the left N3 AD 2 has the spring N3 D 21 (placed between the rack and counter rack) stronger than the others since it has to control the negative balance unit as well. The rack in question bears a red distinguishing mark.

The assembling is carried out in the following order:

*a*) Place the rear end of the special signs rack N3 EO 2 between the first and second hammers on the right;

*b*) Place the rear end of the first rack N3 AQ 4 (provided with the pin **A**) between the second and third hammers.

*c*) Proceed in order from right to left placing the rack with the red mark in position on the extreme l. h.

*d*) Insert the shaft N3 D 5 through the front slots of the racks.

Clamp the shaft to the right inner side frame of the machine with the plate N3 D 29 and screw 120359.

N.B. - From the machines with serial number 436951/E, 915901/D, the springs N3 D 15 are been substituted with N3 D 21 springs.

### MC 14 M - E

In place of the rack N3 AQ 4, a standard rack should be used.

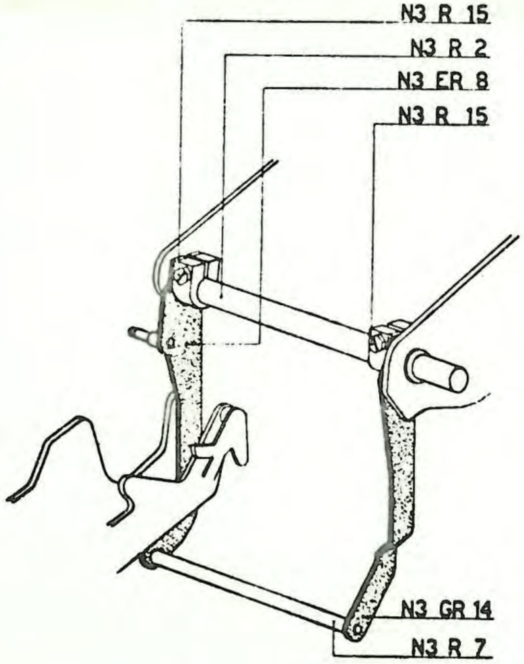


fig. 9

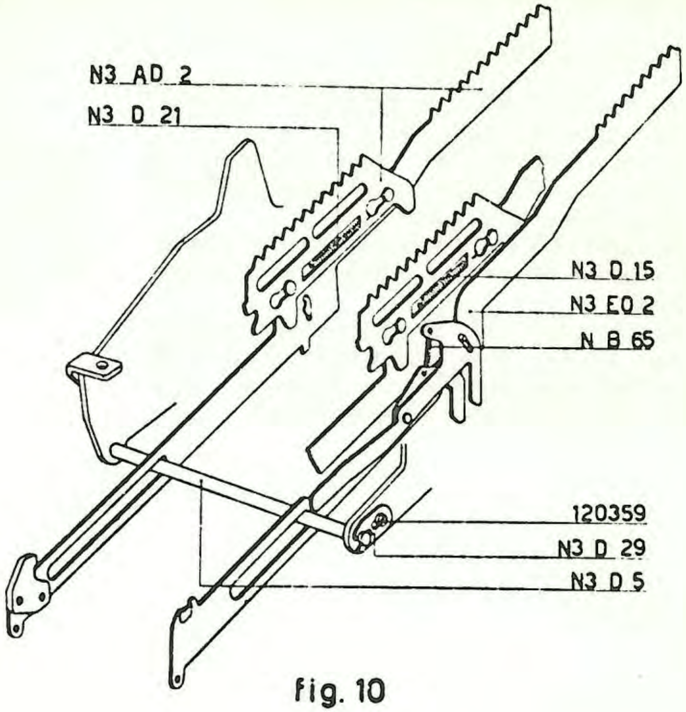


fig. 10

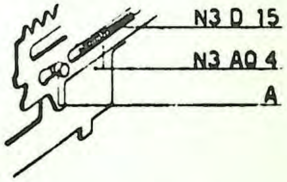


fig. 10a

## 12 - Assembling the front comb N3 ED 8.

MC 14 D - M - E (Figure 11)

*a*) Place the comb N3 ED 8 in position; it must be guided at rear by the shaft N3 D 5.

Lower the comb making sure that the tangs **C** of the racks and the plate **P** of the special signs rack are inserted in the corresponding guide slots.

*b*) Push the comb N3 ED 8 towards the rear of the machine with a screw driver and clamp it to the base with screw 120402.

*c*) Place the stop plate N3 D 28 on the comb N3 ED 8 with two screws 1253027, two eccentric nuts N3 B 38 with corresponding washers 40503 in between. The screws should only be partially screwed down.

## 13 - Assembling the horizontal racks guide bar N3 GD 10.

MC 14 D - M - E (Figure 12)

Bring the horizontal racks into the 9 position. Insert the guide bar N3 GD 10 through the rear slots of the eleven horizontal racks and of the special signs rack. Clamp the bar to the side N3 A 12 with a screw 120304 and to the side N3 A 11 with two screws 120304 placing the washer 40312 under the rear screw.

Screws 120304 should only be partially screwed down.

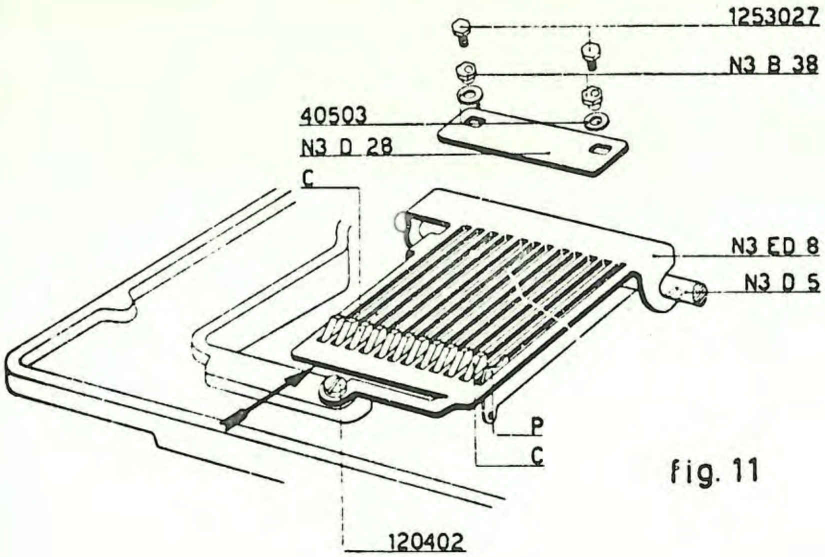

1253027
N3 B 38
40503
N3 D 28
C
N3 ED 8
N3 D 5
P
C
120402

fig. 11

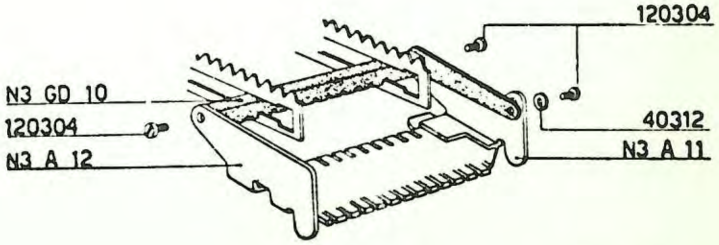

120304
N3 GD 10
120304
N3 A 12
40312
N3 A 11

fig. 12

## 14 - Assembling the intermediate comb N3 D 9.

### MC 14 D - M - E (Figures 13 and 13a)

Turn the machine upside down and place the intermediate comb N3 D 9 in position; the fixed pins **P** and the adjustable $\mathbf{P}_1$ should be inserted in the corresponding slots of the comb. The shank **C** of the special signs rack and the guide tenons **T** of the eleven horizontal racks are lodged in the corresponding guide slots.

Adjust the position of the pins $\mathbf{P}_1$ so that the inner face of the left inner side frame of the machine and the outer face of the shank **C** of the special signs rack are 7.2 mm from each other (see figure 13a also).

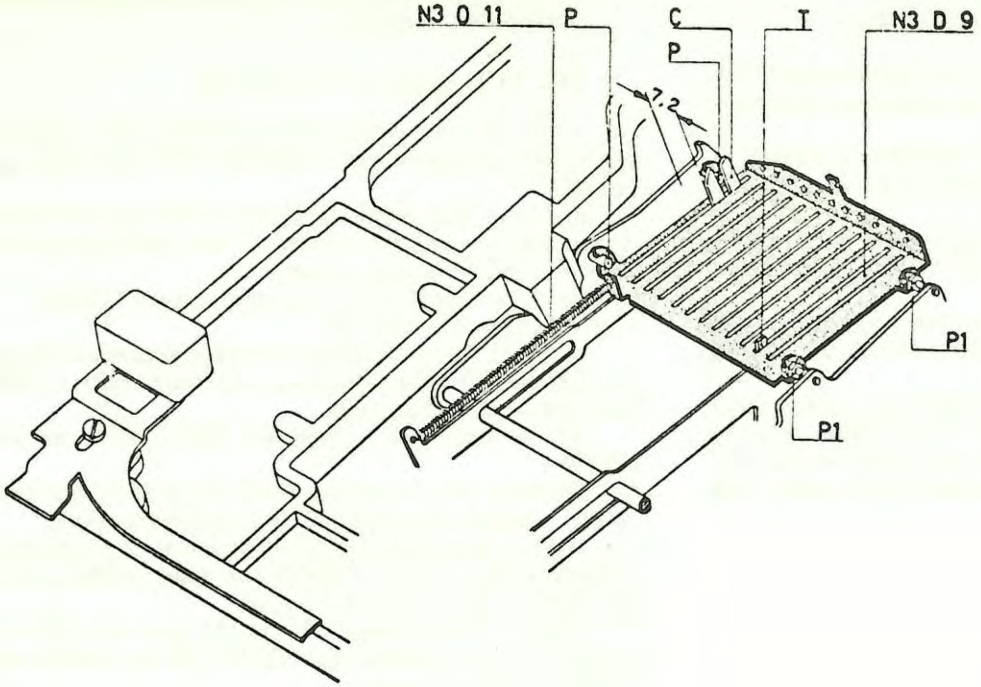


fig. 13

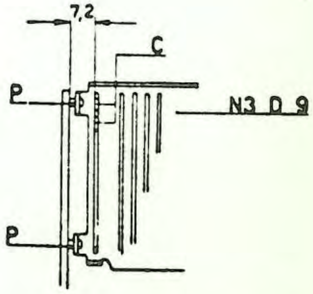


fig. 13a

## 15 - Assembling the gear pinions N3 T 5.

### MC 14 D - M - E (Figures 14 and 14a)

*a*) Insert the shaft N3 D 5 in the appropriate hole in the inner right side frame of the machine, and on it lodge, in the following order:
— a collar N3 T 28 with its screw 1203014; it should be in such a position that its side thickness is turned towards the left side of the machine;
— twelve gear wheels N3 T 5 which should be placed in the same direction as the collar N3 T 28 (figure 14a);
— the distance tube N3 T 29.

*b*) Secure the shaft N3 D 5 to the right inner side frame of the machine with the plate N3 D 29 and its screw 120359.

c) Bring the distance tube N3 T 29 into contact with the left side; move the collar N3 T 28 axially so as to allow the gear wheels N3 T 5 an axial play of 0.2 mm. When this condition is obtained, clamp the collar with a screw 1203014.

## 16 - Assembling the shaft of the multiplier gear pinions N3 Q 44 and the quotient accumulating pinion N3 GQ 38.

### MC 14 D (Figures 14 and 14b)

*a*) Attach the pinion N3 GM 75 to the right hand end of the multiplier gear shaft N3 Q 44 with two screws 1203014.

*b*) Insert the shaft N3 Q 44 in the appropriate hole in the right inner side frame of the machine and on it lodge in the following order:
— the collar 142462 with its two screws 123303;
— the pinion N3 GQ 43.

c) Insert the shaft of the quotient accumulating pinion N3 GQ 38 from the left inner side frame of the machine into the appropriate hole.

On it lodge the pinion N3 GQ 9 with its screws 120302.

*d*) Insert the pin of the shaft N3 Q 44 in the opening in the head of the shaft N3 GQ 38 (figure 14b)

e) Push the shaft N3 Q 44 towards the interior and clamp with two screws 123303, the collar 142462, allowing the shaft an axial play of 0.2 mm.

N.B. — The pinions N3 GM 75 and N3 GQ 9 have recently been replaced by N3 M 275 on which screws 124406 should be used.

Pinion N3 GQ 43 has been replaced, in its turn, by the N3 Q 243.

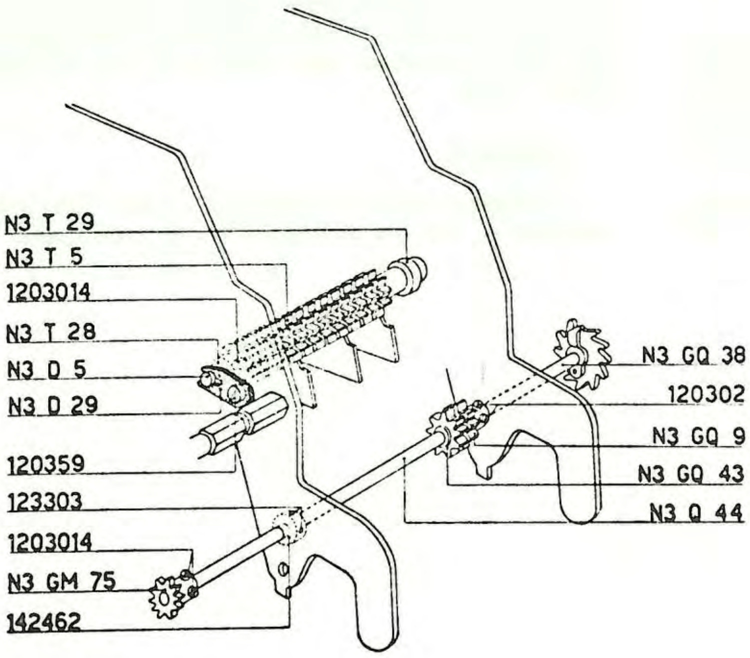


fig. 14

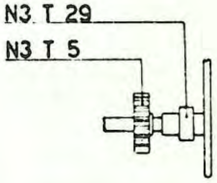


fig. 14a

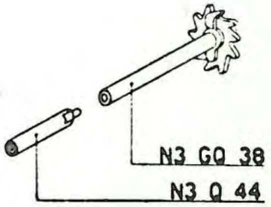


fig. 14b

### MC 14 M (Figure 15)

*a*) Attach the pinion N3 GM 75 to the right hand end of the multiplier transmission shaft N3 M 77 with two screws 1203014.

*b*) Insert the shaft N3 M 77 in the appropriate hole in the right inner side frame of the machine and lodge a second pinion N3 GM 75 with its screws 1203014 on it.

Make the shaft come out through the corresponding guide hole in the left inner side frame of the machine; place a flexible clip 45281 on the end of the shaft.

*c*) Move the pinion N3 GM 75 (placed between the sides of the machine) axially so as too allow the shaft N3 M 77 an axial play of 0.2 mm. When this condition is reached screw down the two screws 1203014.

N.B. — The pinions N3 GM 75 have recently been replaced by the N3 M 275 on which screws 124406 must be used. As the N3 M 275 is narrower than the N3 GM 75, this difference must be compensated for the pinion placed between the sides of the machine by the addition of a washer 40454.

### MC 14 E

The pieces listed in paragraph 16 for Divisumma and Multisumma are not assembled on Elettrosumma.

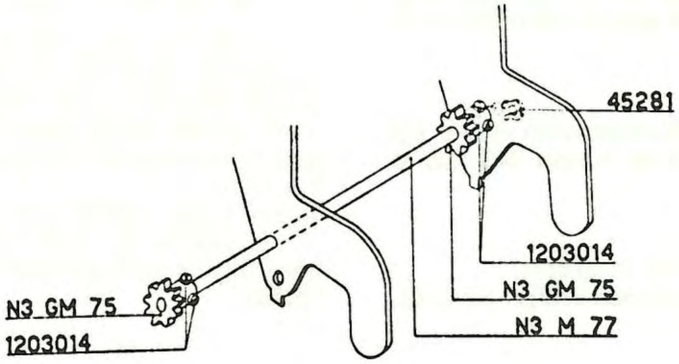


fig. 15

## 17 - Assembling the tens recharge bar N3 ED 24.

### MC 14 D - M - E (Figure 16)

*a*) Arrange the tens recharge bar N3 ED 24 in place between the two inner sides of the machine as shown in the figure; ensure that pin **A** of the bar is inserted in the proper hole of the right inner side.

Insert the shaft N3 D 5 in the hole in the left inner side, push it forward and slip the special collar N3 D 31 onto it, with the screw 120262.

## 18 - Assembling the circular transmission hook N3 Q 72 and the tens carry over hooks N3 GD 4.

### MC 14 D (Figure 17)

*a*) On the shaft N3 D 5 lodge in order:

— the left side of the circular transmission bridge, N3 Q 72;

— ten tens carry over hooks N3 GD 4;

— a washer 40503 which must be placed between the boss of the last N3 GD 4 and the right side of the bridge N3 Q 72;

— the collar N3 Q 52 with its screw 125262.

*b*) Secure the shaft N3 D 5 to the right inner side of the machine with the plate N3 D 29 and a screw 120359.

### MC 14 M - E (Figure 18)

*a*) On the shaft N3 D 5 lodge in order:

— the left side of the circular transmission bridge N3 D 7;

— ten tens carry over hooks N3 GD 4;

— a washer 40503 which must be placed between the boss of the last N3 GD 4 and the right side of the bridge N3 D 7;

— the collar 142517 with a screw 120262.

*b*) Secure the shaft N3 D 5 to the right inner side frame of the machine with the plate N3 D 29 and a screw 120359.

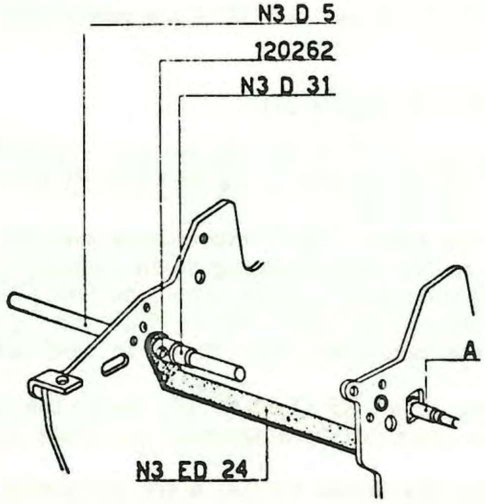


fig. 16

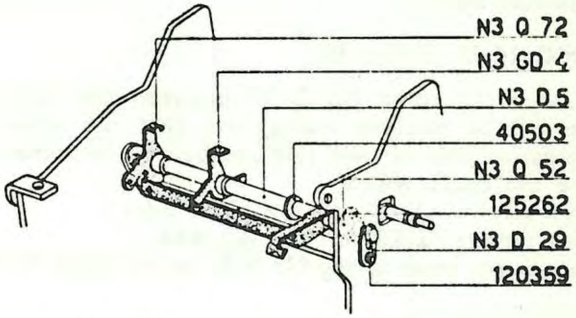


fig. 17

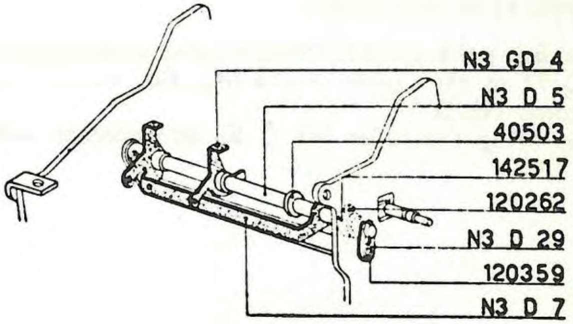


fig. 18

## *19 - Assembling the front comb N3 D 17 for horizontal racks.

**MC 14 D** (Figure 19)

Lodge the comb N3 D 17 between the inner side frames of the machine taking care that the lever **L** of the negative balance unit remains below the comb itself. Secure the comb with:

— two screws 120261 on the right side;
— two screws 121261 on the left side.

Hook the small spring N3 N 21 to the comb N3 D 17.

**MC 14 M - E**

See paragraph 19 for MC 14 D. Do not hook on the small spring N3 N 21.

## 20 - Adjusting position and play of transmission hooks.

**MC 14 D** (Figure 20)

*a*) Bring the point **P** of the circular transmission hook N3 Q 72 to the centre of the first slot on the right of the comb N3 D 17.

*b*) Bring the collar N3 Q 52 into contact with the N3 Q 72 and clamp it to the shaft, screwing down completely the screw 125262, the head of which should be facing up.

*c*) Push the special collar N3 D 31 to the right so as to allow the tens carry over hooks an axial play of 0.2 mm. Clamp the collar N3 D 31 to the shaft; screw 120262 should have its head towards the front of the machine.

Check that the hooks N3 GD 4 are completely free to turn.

**MC 14 M - E** (Figure 21)

*a*) Bring the point **P** of the circular transmission hook N3 D 7 to the centre of the first slot on the right of the comb N3 D 17.

*b*) Bring the collar 142517 into contact with N3 D 7 and clamp it to the shaft screwing down completely the screw 120262, the head of which should be facing up.

*c*) Push the special collar N3 D 31 to the right so as to allow the tens carry over hooks an axial play of 0.2 mm.

Clamp the collar N3 D 31 to the shaft; the screw 120262 should have its head towards the front of the machine.

Check that the hooks N3 GD 4 are completely free to rotate.

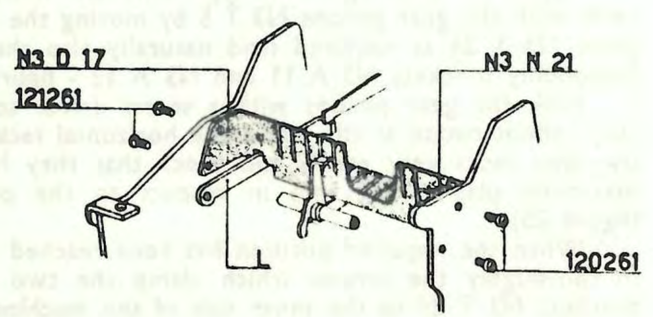


Fig. 19

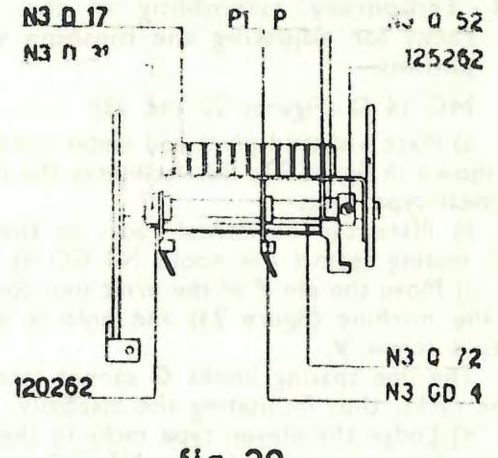


Fig. 20

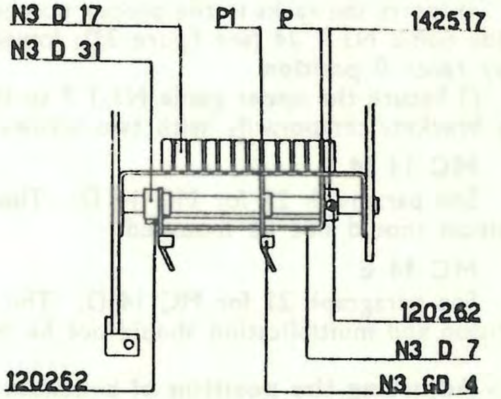


Fig. 21

### *21 - Temporary assembling of the vertical type racks for adjusting the meshing with the gear pinions.

**MC 14 D** (Figures 22 and 23)

*a*) Place a shaped pivot rod under the hooks N3 GT 8 as shown in figure 22; this facilitates the insertion of the vertical type racks.

*b*) Place the horizontal racks in the zero position (i.e. resting against the hooks N3 GD 4).

*c*) Move the pin **P** of the print unit towards the front of the machine (figure 23) and hold it in this position with a screw **V**.

The line spacing hooks **G** cannot interfere with the type racks, thus facilitating the assebmly.

*d*) Lodge the eleven type racks in the corresponding slots of the upper guide bar N3 T 7 and the multiplication printing rack and the division printing rack respectively in the guide openings **A** and **B** of the bar. The vertical rack for the special signs should not be put in place.

*e*) Insert the racks in the proper notches of the lower guide comb N3 T 24 (see figure 23); lower them so that they reach 0 position.

*f*) Secure the upper guide N3 T 7 to the corresponding brackets temporarily with two screws 120261.

**MC 14 M**

See paragraph 21 for MC 14 D. The type rack for division should not be mounted.

**MC 14 E**

See paragraph 21 for MC 14 D. The type racks for division and multiplication should not be mounted.

### 22 - Adjusting the position of brackets N3 A 10 and N3 A 24.

**MC 14 D - M - E** (Figure 24)

Adjust the positions of the brackets N3 A 10 and N3 A 24 so that there is the required distance of 49.5 mm between the guide bar N3 T 7 and the hammers holding frame shaft N3 T 39.

When this condition has been obtained, screw down the screws 120303 of the two brackets N3 A 10 and N3 A 24 completely.

### 23 - Adjusting the meshing of the type racks and horizontal racks with the gear pinions N3 T 5.

**MC 14 D - M - E** (Figures 23 and 25)

Adjust the meshing of the type racks and horizontal racks with the gear pinions N3 T 5 by moving the lower guide N3 T 24 as required (and naturally also the corresponding brackets N3 A 11 and N3 A 12 - figure 23).

Lock the gear pinions with a screw driver so that they cannot rotate at all. Move the horizontal racks and the type racks very gently and check that they have a maximum play of 0.2 mm in respect to the pinions (figure 25).

When the required position has been reached screw in thoroughly the screws which clamp the two guide brackets N3 T 24 to the inner side of the machine.

Adjust the position of the guide bar N3 GD 10 so that it is level with the horizontal racks. This can be done by moving the arm of the bar along the slot **H**. Screw down the screws which clamp the bar N3 GD 10. Check that the racks are perfectly free to slide. Bring the type rack to the 9 position and check that it can belowered to the below 0 position without slowing up.

Unscrew the two screws 120261 and remove the small bar N3 T 7, slipping out the type racks.

Remove the screw **V** which was used temporarily (see paragraph 21c).

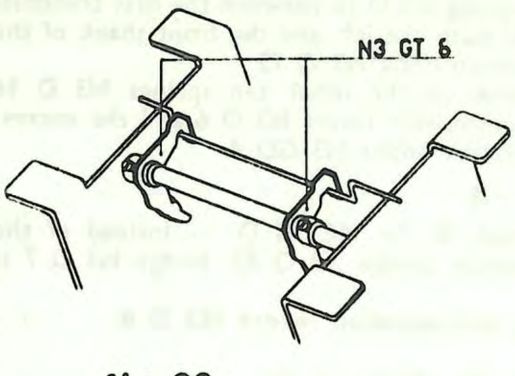


fig. 22

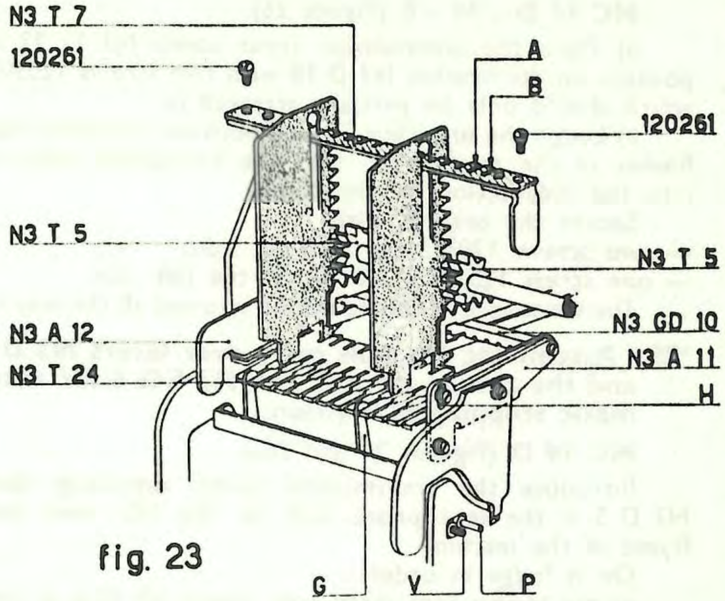


fig. 23

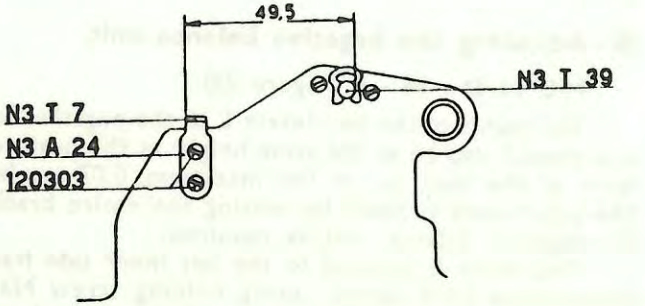


fig. 24

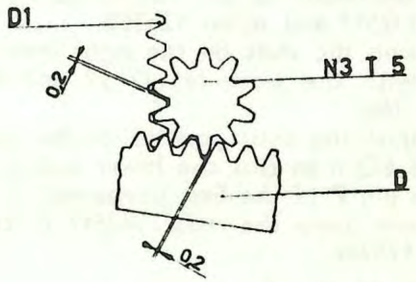


fig. 25

### *24 - Assembling the bracket N3 D 18 and the comb for transmission lever N3 D 12.

#### MC 14 D - M - E (Figure 26)

*a*) Place the transmission lever comb N3 D 12 in position on the bracket N3 D 18 with two screws 120303, which should only be partially screwed in.

*b*) Lodge the unit thus formed between the inner side frames of the machine so that the horizontal racks fit into the indentations of the comb.

Secure the bracket with:

— two screws 120353 on the right side;
— one screw 125357 (hole **A**) on the left side.

The three screws should not be screwed all the way in.

### *25 - Assembling the tens carry over levers N3 D 6 and the rocker for pull rod N3 EQ 6 for automatic stopping of division.

#### MC 14 D (Figures 26 and 26a)

Introduce the transmission levers sustaining shaft N3 D 5 in the appropriate hole on the left inner side frame of the machine.

On it lodge in order:

*a*) the eleven tens carry over levers N3 D 6 so that they lodge:

— in front in the vertical indentations of the comb N3 D 17;
— at the rear in the indentations of comb N3 D 12;

*b*) the rocker for pull rod N3 EQ 6 with its positioning collar 142517 and screw 125262.

Clamp the shaft on the right inner side of the machine with the plate N3 D 29 and its screw 125357 (figure 26a).

Adjust the axial position of the rocker of the pull rod N3 EQ 6 so that the lower end is centered in relation to pin **P** of the first horizontal rack N3 AQ 4. At this point clamp the collar 142517 to the shaft with the screw 125262.

#### MC 14 M - E

See paragraph 25 for MC 14 D. — The pull rod rocker N3 EQ 6 with its positioning collar 142517 and screw 125262 are not used.

### 26 - Hooking spring N3 D 16

#### MC 14 D (Figure 27)

*a*) Hook a spring N3 D 16 between the first transmission lever N3 D 6 on the left and the front shank of the circular transmission hook N3 Q 72.

*b*) Then hook on the other ten springs N3 D 16 between the transmission levers N3 D 6 and the corresponding transmission hooks N3 GD 4.

#### MC 14 M - E

See paragraph 26 for MC 14 D. — Instead of the circular transmission bridge N3 Q 72, bridge N3 D 7 is used.

### 27 - Adjusting transmission levers N3 D 6.

#### MC 14 D - M - E (Figure 28)

The rear points **P** of the transmission levers N3 D 6 should be at the same height as the peaks of the teeth of the racks or 0.07 mm lower. The adjusting is done by moving the bracket N3 D 18 and the comb N3 D 12 as required.

The operation is carried out, naturally, when the transmission hooks N3 GD 4 are hooked to the corresponding transmission levers N3 D 6 as shown in the figure.

### 28 - Adjusting the negative balance unit.

#### MC 14 D - M - E (Figure 28)

The points of the two levers **L** of the negative balance unit should also be at the same height as the peaks of the teeth of the rack or, at the maximum, 0.07 mm higher. The adjustment is made by moving the entire bracket of the negative balance unit as required.

This latter is secured to the left inner side frame of the machine by a special spring holding screw N3 F 10 and the screw 120307 (figure 2). The hole made in the side of the machine for screw 120307 is enlarged; so it is possible to raise or lower the whole negative balance unit which can rotate around the special screw N3 F 10.

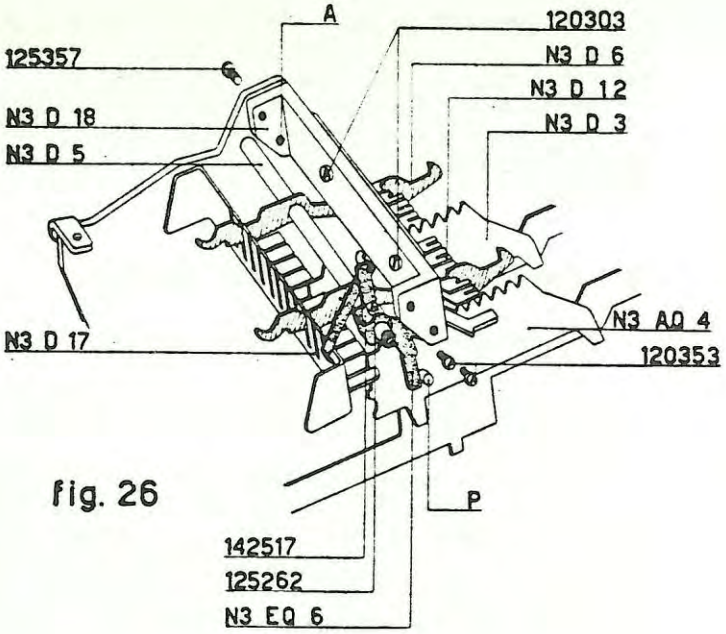


fig. 26

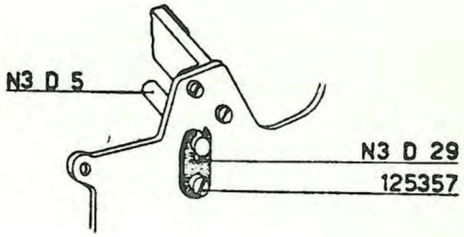


fig. 26a

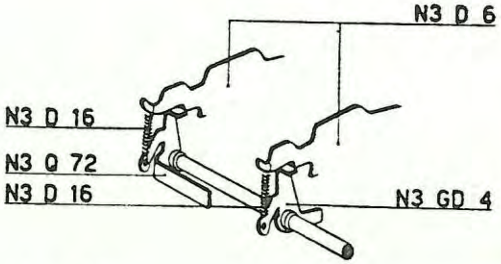


fig. 27

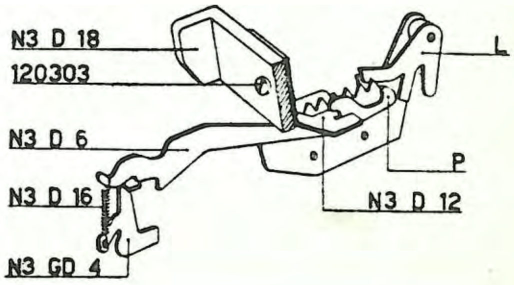


fig. 28

## *29 - Assembling the accumulator.

### **MC 14 D** (Figure 29)

Arrange the entire accumulator unit between the inner sides of the machine as shown in the figure. Clamp the accumulator bracket arms with pivot screws N3 E 23 and nut 138506 on the right and N3 E 18 on the left. Make sure that the spring N3 N 21 is this side of the comb N3 D 17 and that the rocker lever N3 EQ 6 is above the connecting shaft of the two bracket arms of the accumulator.

### **MC 14 M - E**

See paragraph 29 for MC 14 D. — Naturally the spring N3 N 21 and the rocker N3 EQ 6 are not required.

## *30 - Adjusting the axial position of the accumulator.

### **MC 14 D - M - E** (Figure 30)

The figure is seen from the rear of the machine, looking across the segments of the print unit.

The accumulator wheels **R** should cover the corresponding rack N3 D 3; the condition is reached by moving the two pivot screws N3 E 23 (see the preceding paragraph) as required.

In addition check that the return teeth of the individual wheels entirely cover the thickness of the transmission levers N3 D 6. The last wheel should have the second return tooth covered by the corresponding lever **L** of the negative balance unit.

The tolerance is such that the left surface of the individual racks may be flush with but not project from the left surface of the corresponding wheels.

When the desired conditions are obtained lock the nuts clamping the pivot screws N3 E 23. The accumulator should have absolutely no axial play but should be free to rotate.

## *31 - Adjusting the accumulator meshing.

### **MC 14 D - M - E** (Figures 29 and 31)

*a*) Place the shaft N3 H 26 in position on the left inner side frame of the machine with the washer 40353 in between (figure 29).

*b*) Place the accumulator meshing control cam N3 EH 5 on the shaft (figure 31) so that the roller **R** is inserted in the corresponding slot. Move the control cam by hand and make sure that when the roller **R** has reached the position shown in figure 31, the accumulator wheels are already meshed with the horizontal racks. Move the eccentric N2 F 18 until a condition is reached when, with the accumulator wheels held steady, the horizontal racks have a maximum clearance of 0.2 mm in relation to them. Make sure that the greater eccentricity of the N2 F 18 is turned towards the front of the machine.

*c*) As the movement of the cam N3 EH 5 towards the front of the machine continues, the flexible coupling of the accumulator (spring N3 E 24) goes into action. The distension of the spring should be minimal; the condition is obtained by moving the eccentric **E** as required. This also should have the point of greatest eccentricity turned towards the front of the machine.

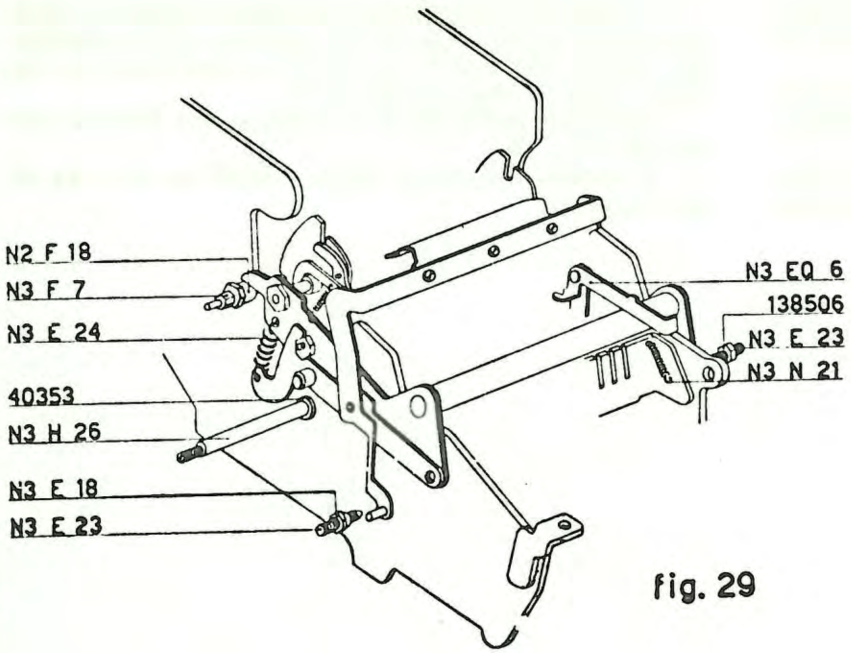


fig. 29

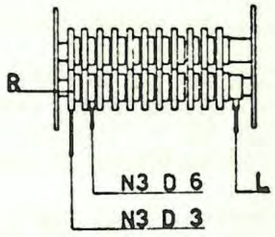


fig. 30

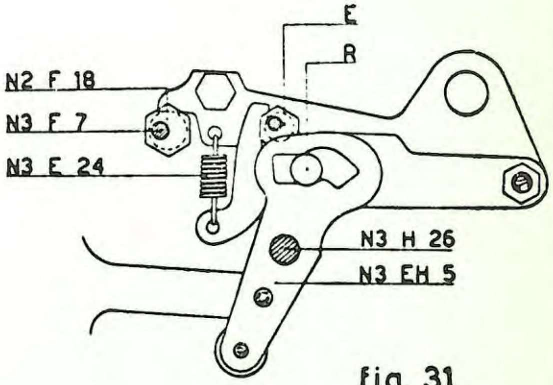


fig. 31

## *32 - Assembling accumulator meshing control unit.

### MC 14 D - M - E (Figures 32 and 32a)

*a*) Hook the spring N3 H 6 to the anchor plate N3 EH 5.

*b*) Lodge the pin carrying disk N3 GH 3 between the rear fork of the anchor plate N3 EH 5. Introduce a distance tube N3 H 11 in the central hole of the disk. Place the unit so formed in position on the left side of the machine.

*c*) Lodge the anchor raising lever N3 EH 12 on the pin N3 H 37, and also the front arm of the bracket N3 EH 110 and a distance tube N3 H 11.

Screw in the pin N3 H 37 for the depth of a few threads on the side of the machine. Make sure that the pin **P** of the N3 EH 12 is lodged in the lower slot of the anchor plate N3 EH 5.

*d*) Insert the screw 1253512 in the upper hole of the bracket N3 EH 110 and then in the tube N3 H 11 lodged on the disk N3 GH 3.

*e*) Clamp down the screw 1253512 and the pin N3 H 37.

*f*) Hook the spring N3 H 6 to the bend of the bracket N3 EH 110 (figure 32a).

*g*) Place the accumulator control trip lever N3 H 8 in position on the side of the machine with a flexible clip 45281. The end of the N3 H 8 should rest on the lower roller of the cam N3 EH 5.

Hook the spring N3 T 43 between the N3 H 8 and the pin N3 F 10.

*h*) Attach the spring holder 136352 to the side of the machine.

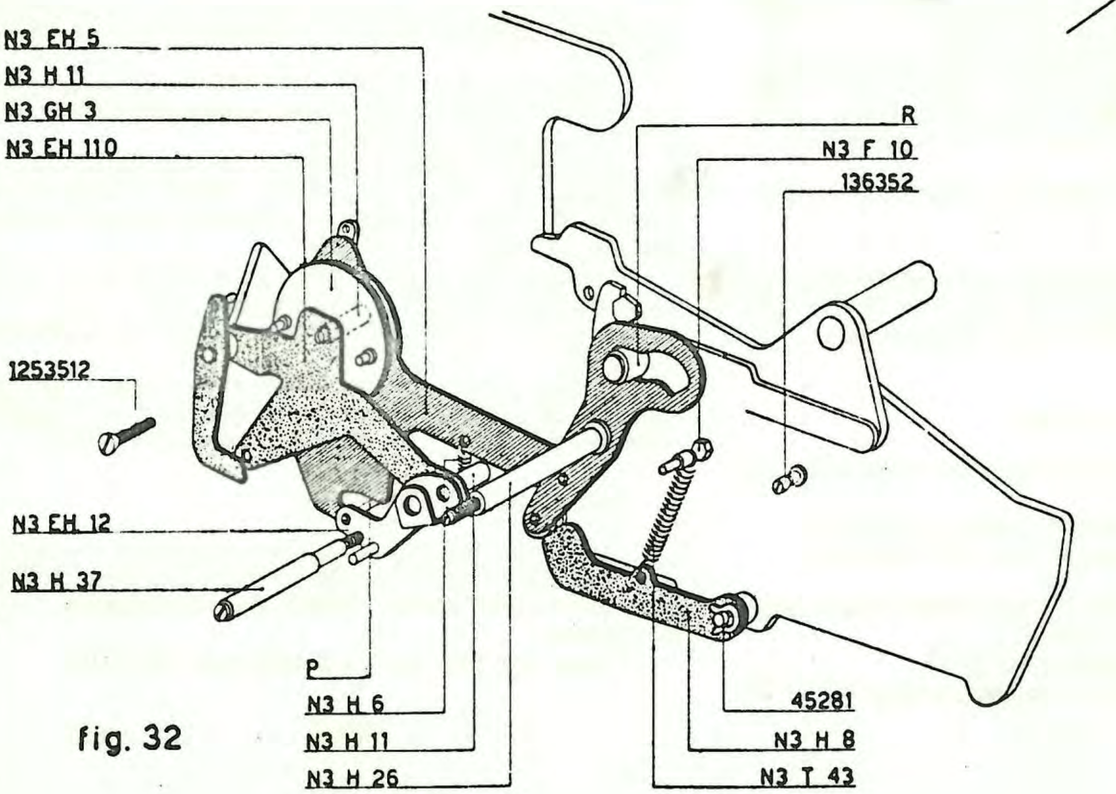


fig. 32

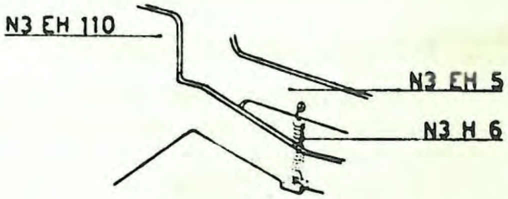


fig. 32a

## *33 - Assembling the toothed sector and anchor plate for accumulator inversion.

### MC 14 D - M - E (Figure 33)

*a*) Place the trip lever N3 H 117 in position on the appropriate pin on the right inner side frame of the machine, securing it with a flexible clip 45361. Hook a head of spring N3 H 47 to the N3 H 117.

*b*) Place the toothed sector and the anchor plate for accumulator inversion N3 EH 115 on the proper pin on the right side frame of the machine so that the sector itself meshes with the pinion **R** of the accumulator, as shown in the figure.

Secure the unit N3 EH 115 with a flexible clip 45281.

## 34 - Preparing and assembling the release bridge unit N3 GQ 8, the control lever N3 GQ 12 and the accumulator inversion anchor plate control link N3 GG 28.

### MC 14 D (Figures 34 and 35)

*a*) On the steady pin N3 Q 5 introduce in the following order:

- the right bend of the release bridge N3 GQ 8;
- the right arm of the control lever N3 GQ 12;
- the washer 40402;
- the front slot of the control lever of the accumulator inversion anchor plate N3 GG 28;
- the threaded distance bushing N3 Q 39.

*b*) Screw the pin N3 Q 5 on the bushing N3 Q 39 until its point is level with the left bend of the N3 GQ 12.

*c*) Insert the point of pin N3 Q 5 in the proper hole of the right inner side frame of the machine (figure 35).

*d*) Advance the pin N3 Q 5 slowly; on it screw the bushing support for shutting off circular transmission N3 Q 40 so that its plane surface is in contact with the side.

*e*) Arrange the bushing support for shutting off circular transmission N3 Q 3 in the groove of the bushing N3 Q 40.

*f*) Screw in the pin N3 Q 5 until its point projects from the left bend of the release bridge N3 GQ 8. On it lodge a flexible clip 45221.

*g*) Lodge the flexible clip 45281 in the proper slot in the steady pin N3 Q 5. Washer 40402 should be in contact with the accumulator inversion anchor control link N3 GG 28.

*h*) Adjust the position of the pin N3 Q 5 so as to allow the link N3 GG 28 a slight axial play.

*i*) At this point lock the two bushes N3 Q 39 and N3 Q 40.

*l*) Make sure that the lower end of the plate for shutting off circular transmission N3 Q 3 is engaged with the bend **G** of the circular transmission bridge.

### MC 14 M - E (Figure 36)

Clamp the front part of the accumulator inversion anchor control link N3 GG 28 on the right inner side of the machine with a stud 1263037 and the distancer 40305 in between.

Clamp the stud with a flanged nut N3 G 60.

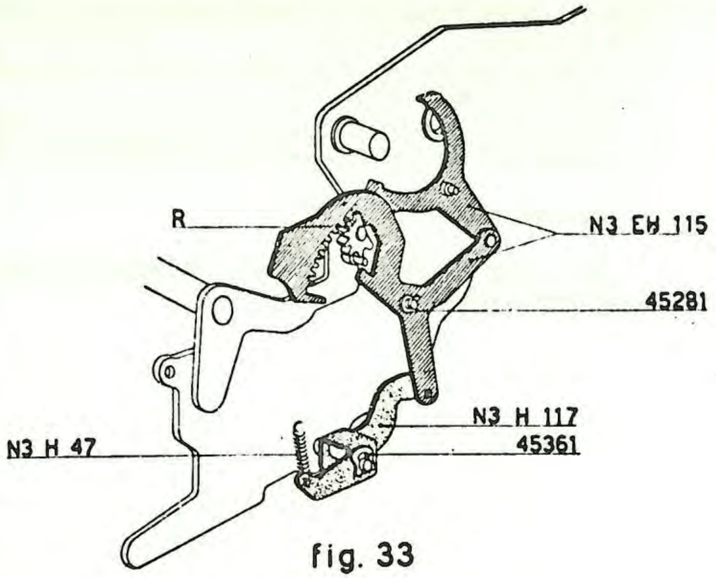


fig. 33

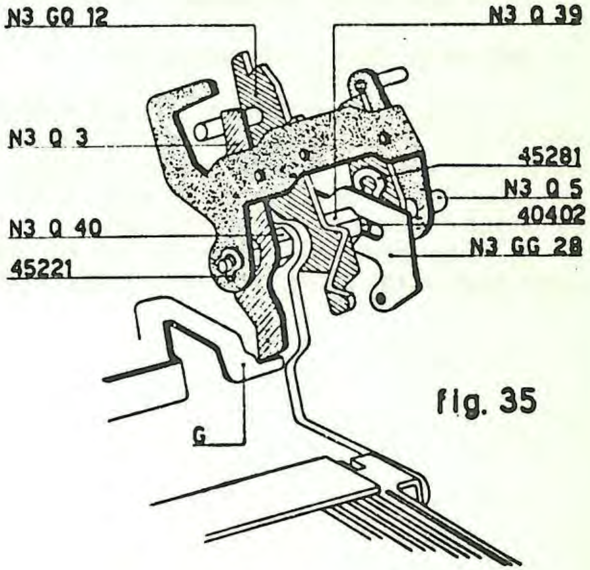


fig. 35

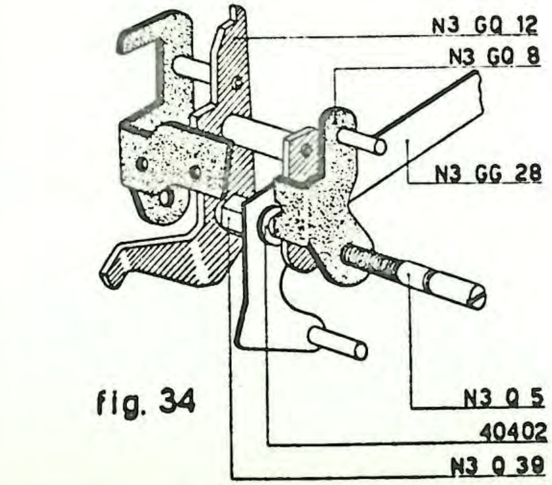


fig. 34

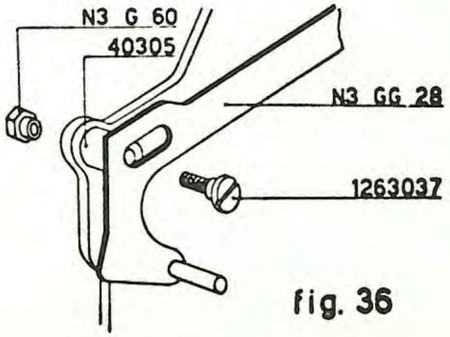


fig. 36

## *35 - Assembling the link N3 GG 28 on the inner right side of the machine.

### MC 14 D (Figures 37, 38 and 39)

*a*) Clamp the accumulator inversion anchor control link N3 GG 28 on the right inner side frame of the machine with a screw 1263037, placing a washer 40305 in between. The pin P of the anchor plate N3 EH 115 must be lodged in the rear slot of the link.

*b*) Hook spring N3 I 11 to the link N3 GG 28; the other head of the spring is hooked to the washer 40503. Place the latter on the pin R of the Transmissions restoring control bridge.

*c*) Hook spring N3 N 21 to the circular transmission plate N3 Q 3 (figure 38).

Check that the front bend of the rocker N3 EQ 6 is engaged with the fork of the bridge N3 GQ 8 (figure 39).

### MC 14 M - E

See paragraph 35 for MC 14 D. The operations given in c) should not be carried out.

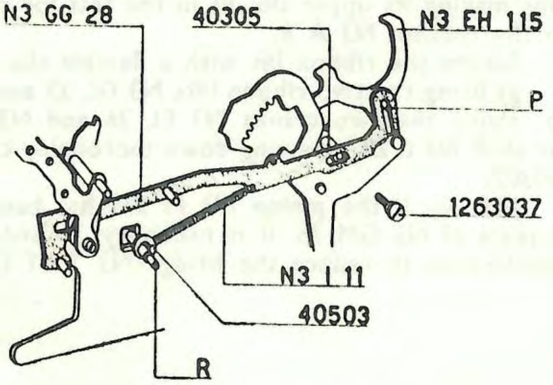


fig. 37

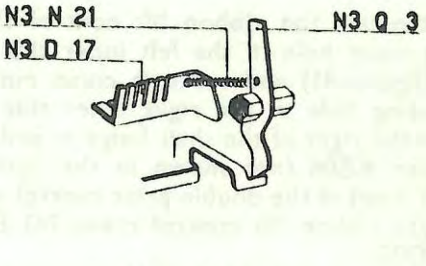


fig. 38

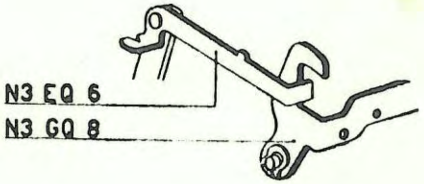


fig. 39

## *36 - Assembling the ribbon lift arms and the double print control hook.

### MC 14 D - M - E (Figures 40 and 41)

*a*) Introduce the ribbon lift control shaft N3 L 25 into the proper hole in the left inner side frame of the machine (figure 41) and make it come out through the corresponding hole in the right inner side frame.

*b*) On the right of the shaft lodge in order (figure 40):

— a washer 40506 (not shown in the figure);
— the left bend of the double print control hook N3 T 31;
— the right ribbon lift control crank N3 EL 27 with its screw 120302;
— the right bend of the double print control hook N3 T 31.

*c*) Lodge the pin of the crank N3 EL 27 in the lower opening of the right ribbon lift N3 GL 24. The ribbon lift should be guided from above by the column N3 A 7. Secure it with a flexible clip 45221 (figure 40).

*d*) The shaft N3 L 25 should project from the right bend of the double hook N3 T 31 for the depth of its bevel. Bring the crank N3 EL 27 against the side and screw in its screw 120302 partially (figure 40).

e) On the left side of the shaft N3 L 25 lodge the ribbon lift control crank N3 EL 26 (figure 41); bring it against the side; allow the shaft N3 L 25 a 0.2 mm axial play.

Partially screw in the screw 120302.

*f*) Place the washer 40316 on the pin of crank N3 EL 26 and then the left ribbon lift N3 GL 23 at the same time making its upper slot fit in the seat for the purpose on the column N3 A 6.

Secure the ribbon lift with a flexible clip 45221.

*g*) Bring the two ribbon lifts N3 GL 23 and N3 GL 24 up; clamp the two cranks N3 EL 26 and N3 EL 27 on the shaft N3 L 25, screwing down thoroughly their screws 120302.

N.B. — If the pinion N3 M 275 has been mounted in place of N3 GM 75, it is necessary, in order to avoid interference to reduce the bridge N3 T 31 slightly.

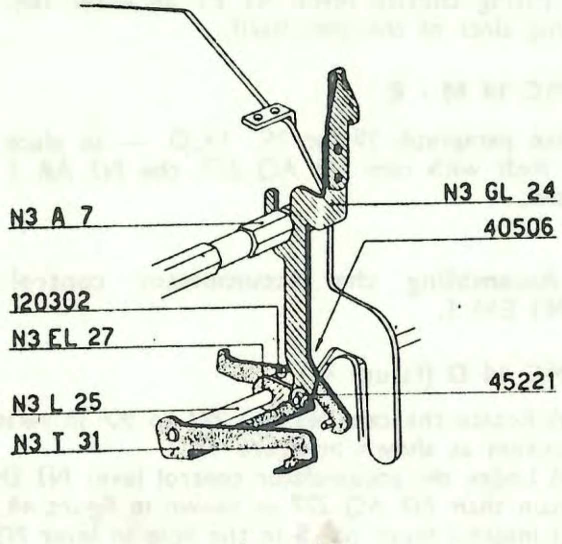

N3 GL 24
40506
N3 A 7
120302
N3 EL 27
45221
N3 L 25
N3 T 31

fig. 40

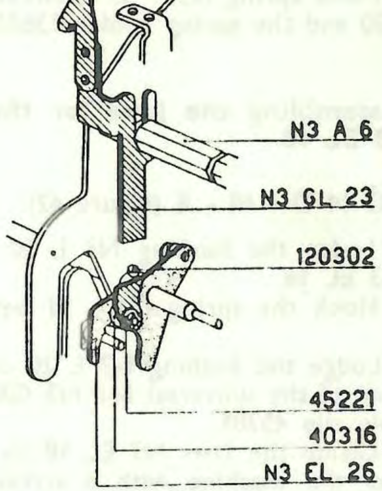

N3 A 6
N3 GL 23
120302
45221
40316
N3 EL 26

fig. 41

### *37 - Assembling the positioner N3 H 30.

**MC 14 D - M - E** (Figure 42)

*a*) Lodge the upper part of the position piece N3 H 30 in the proper seat on the column N3 A 6.

The lower end goes into the groove of the roller **R** of the left crank N3 EL 26.

*b*) Attach the screw 1253024 and the spring holder 136352 on the side of the machine.

*c*) Hook spring N3 T 43 between the position piece N3 H 30 and the spring holder 136352.

### *38 - Assembling the jaws for the ribbon advance N3 EL 18.

**MC 14 D - M - E** (Figure 42)

*a*) Lodge the bushing N3 L 20 between the front jaws N3 EL 18.

*b*) Hook the spring N3 L 31 between the jaws N3 EL 18.

*c*) Lodge the bushing N3 L 20 on the pin **P** of the left lever of the universal bar N3 GR 8. Secure it with a flexible clip 45281.

*d*) Clamp the jaws N3 EL 18 to the left inner side frame of the machine with a screw 126352, placing a washer 40361 between the side frame and the jaw.

### 39 - Assembling the main shaft with cam N3 AQ 27.

**MC 14 D** (Figure 43)

*a*) Place the lever with roller N3 ER 9 in position on the shaft N3 R 2 with its screw N3 R 15 which should be quite loose.

*b*) Put the accumulator in subtraction. All that has to be done is to keep the accumulator out of mesh and move the toothed sector N3 EH 115 towards the back of the machine.

Insert the main shaft N3 AQ 277 in the proper bearing. Bring the cam against the side frame so that the roller **R** of the lever N3 ER 9 and the roller **R**$_1$ of the line spacing control lever N3 ET 36 enter the corresponding slots of the cam itself.

**MC 14 M - E**

See paragraph 39 for MC 14 D. — In place of the main shaft with cam N3 AQ 277, the N3 AR 3 should be used.

### *40 - Assembling the accumulator control lever N3 EH 1.

**MC 14 D** (Figure 44)

*a*) Rotate the cam N3 AQ 277 to 90° in relation to its position as shown in figure 43.

*b*) Lodge the accumulator control lever N3 EH 1 on the main shaft N3 AQ 277 as shown in figure 44.

*c*) Insert a taper pin **S** in the hole in lever N3 EH 1 and in the hole in the shaft N3 AQ 277 so as to obtain the correct angle of the lever in relation on to the main cam.

Screw down the screw N3 R 15 and remove the taper pin **S**.

**MC 14 M - E**

See paragraph 40 for the MC 14 D. — The accumulator control lever N3 EH 1 is assembled on the shaft of cam N3 AR 3.

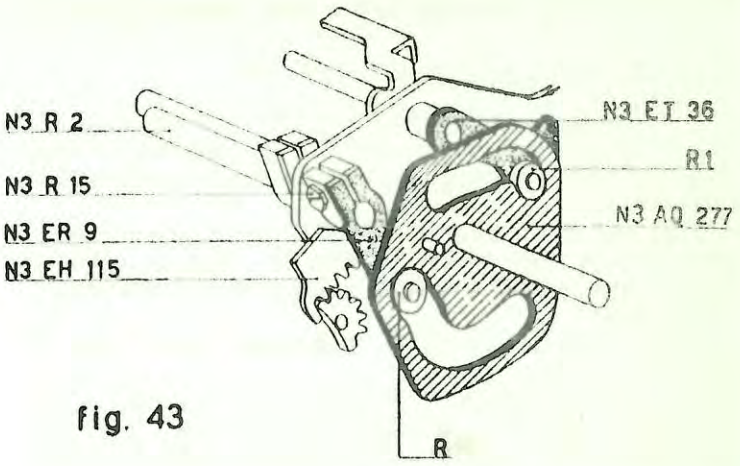


fig. 43

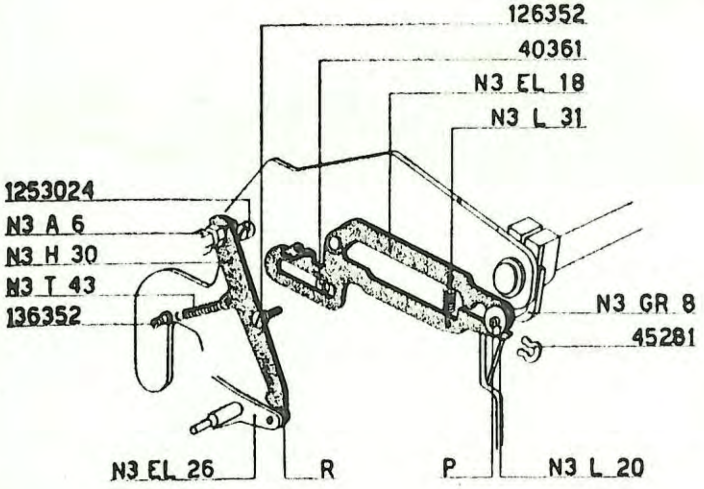


fig. 42

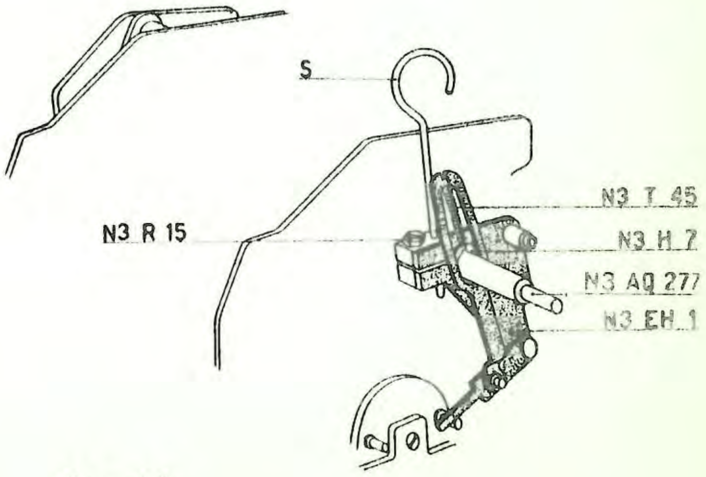


fig. 44

## 41 - Preparing the right outer side frame N3 EA 5.

### MC 14 D - M (Figures 45 and 46)

*a*) Lodge the eccentric N3 B 32 in the proper hore in the repeat lock rocker N3 GN 15, securing it with the nut 138261 which should only be partially screwed on (figure 45).

*b*) Lodge the bushing N3 N 17 in the proper hore of the repeat lock rocker N3 GN 15. Place the bush of the flexible arm N3 GN 16 in position in the proper hole (figure 45).

Hook the spring N3 N 21 between the N3 GN 15 and N3 GN 16.

*c*) Arrange the unit now prepared on the right outer side frame N3 EA 5 as shown in figure 46. Secure it with the screw 1263036 and the apposite shaft N3 M 64.

Hook the spring M2 E 28 between the flexible arm N3 GN 16 and the proper hore in the side frame.

*d*) Place the lever of the slide return hook N3 EN 3 in position on the right outer side frame N3 EA 5 with the screw 126404 and its nut 138405 (figure 46).

Hook spring M3 B 34 as shown in the same figure 46.

*e*) Assemble the right keyboard clamping bracket N3 A 14 on the right outer side frame N3 EA 5 with two screws 120302 which should only be partially screwed in (figure 46).

### MC 14 E (Figure 47)

See paragraph 41 for MC 14 D - M. — The unit referred to in *c*) - N3 GN 15, N3 GN 16 - should be clamped with a stud 1263036 and a nut 138305.

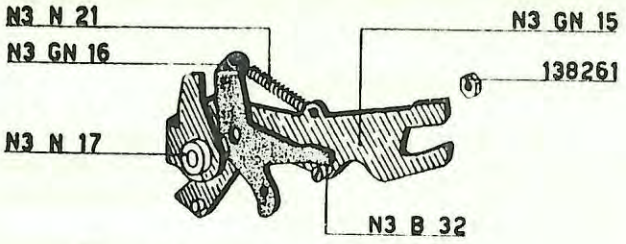


fig. 45

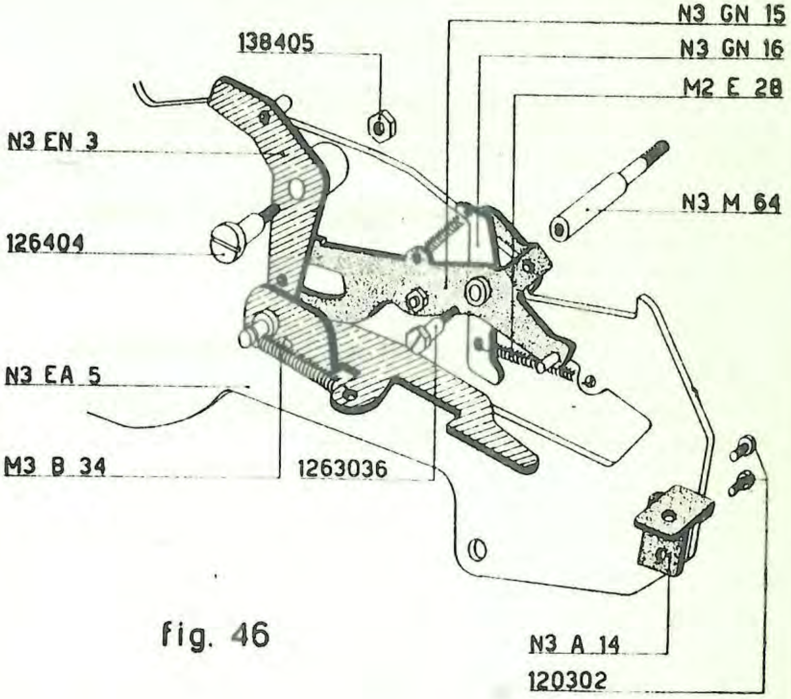


fig. 46

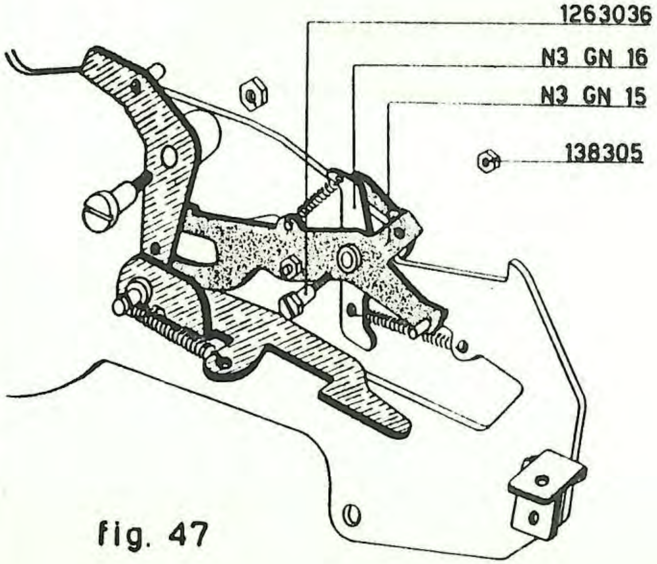


fig. 47

## 42 - Preparing the drive drag-link.

MC 14 D - M - E (Figure 48)

*a*) Place the adjustable plate N3 EN 1 in position on the main shaft crank N3 GR 1 securing it with the screw 121401 and its nut 138405 which should only be partially screwed in.

*b*) On the pin of the adjustable plate N3 EN 1 lodge:

— a washer 40281;
— a roller N3 N 12;
— a second washer 40281.

Secure with a flexible clip 45221.

*c*) Screw on the screw N3 R 15 partially onto the bush of the crank N3 GR 1.

*d*) Join the crank N3 GR 1 to the drag link N3 FV 2, securing it with a flexible clip 45361.

## 43 - Preparing the unit N3 ET 25 - N3 ED 26 - N3 GR 19.

MC 14 - D - M - E (Figure 49)

*a*) Lodge the eccentric N3 B 32 in the proper hole in the tens recharge bar control lever N3 ED 26; use a nut 138261 which should only be partially screwed down.

Hook on the spring N3 D 22.

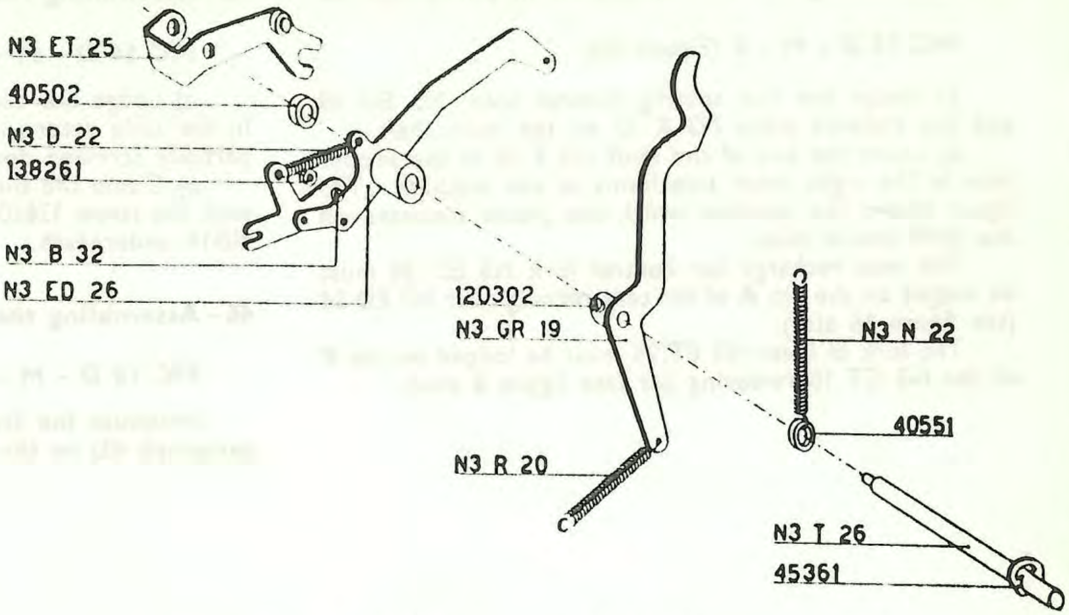
*b*) Hook the spring N3 R 20 onto the levelling spring lever N3 GR 19.

*c*) Hook spring N3 N 22 to washer 40551.

*d*) Place the flexible clip 45361 on the shaft N3 T 26.

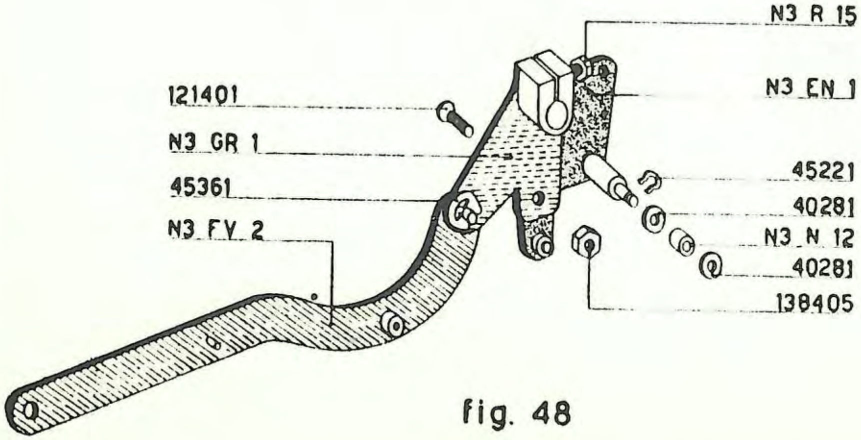
*e*) On the shaft N3 T 26 lodge in order:

— washer 40551 with the spring N3 N 22;
— the levelling spring lever N3 GR 19;
— the tens recharge bar lever N3 ED 26;
— the distance washer 40502;
— the stop levers control lever N3 ET 25.



N3 ET 25
40502
N3 D 22
138261
N3 B 32
N3 ED 26
120302
N3 GR 19
N3 N 22
40551
N3 R 20
N3 T 26
45361

fig. 49



N3 R 15
N3 EN 1
121401
N3 GR 1
45361
N3 FV 2
45221
40281
N3 N 12
40281
138405

fig. 48

## 44 - Assembling the unit prepared in paragraph 43.

**MC 14 D - M - E** (Figure 50).

*a*) Lodge the line spacing control lever N3 EU 29 and the distance piece N3 R 17 on the main shaft.

*b*) Insert the end of the shaft N3 T 26 in the proper hole in the right inner side frame of the machine. The figure shows the position which the pieces mounted on the shaft should take.

The tens recharge bar control fork N3 ED 26 must be lodged on the pin **A** of the tens recharge bar N3 ED 24 (see figure 16 also).

The fork of lever N3 ET 25 must be lodged on pin **P** of the N3 GT 10 restoring bar (see figure 6 also).

## 45 - Assembling the slide return lever N3 EN 9.

**MC 14 D - M - E** (Figure 50)

*a*) Lodge the eccentric N3 N 24 in the proper hole in the slide return lever N3 EN 9 with the nut 138261 partially screwed down.

*b*) Clamp the slide return lever N3 EN 9 to the base with the screw 126503 (left handed thread) placing washer 40514 underneath.

## 46 - Assembling the drive drag link.

**MC 14 D - M - E** (Figure 51)

Introduce the drank link unit (prepared according to paragraph 42) on the shaft of the main cam.

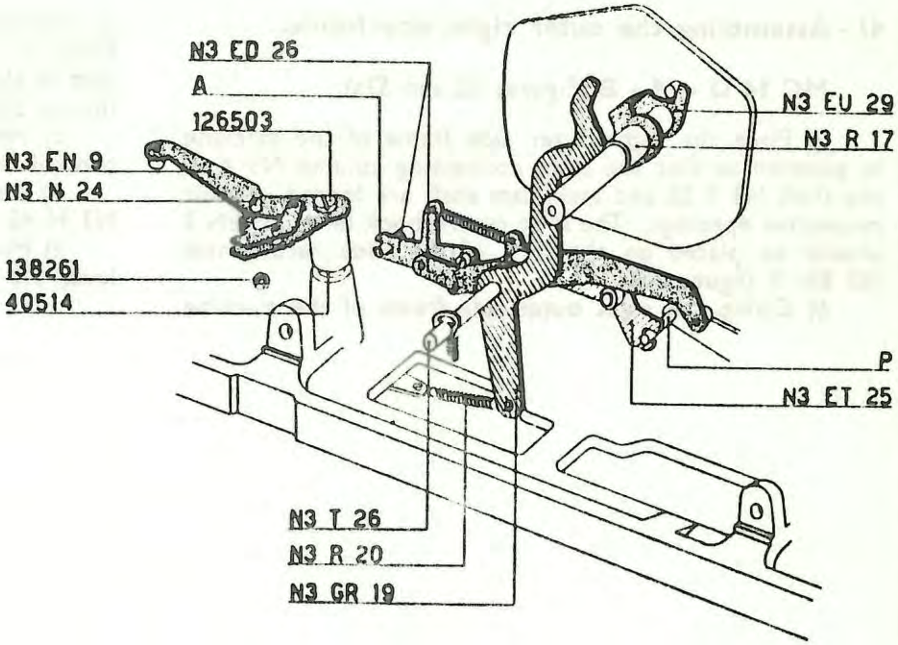

N3 ED 26
A
126503
N3 EN 9
N3 N 24
138261
40514
N3 EU 29
N3 R 17
P
N3 ET 25
N3 T 26
N3 R 20
N3 GR 19

fig. 50

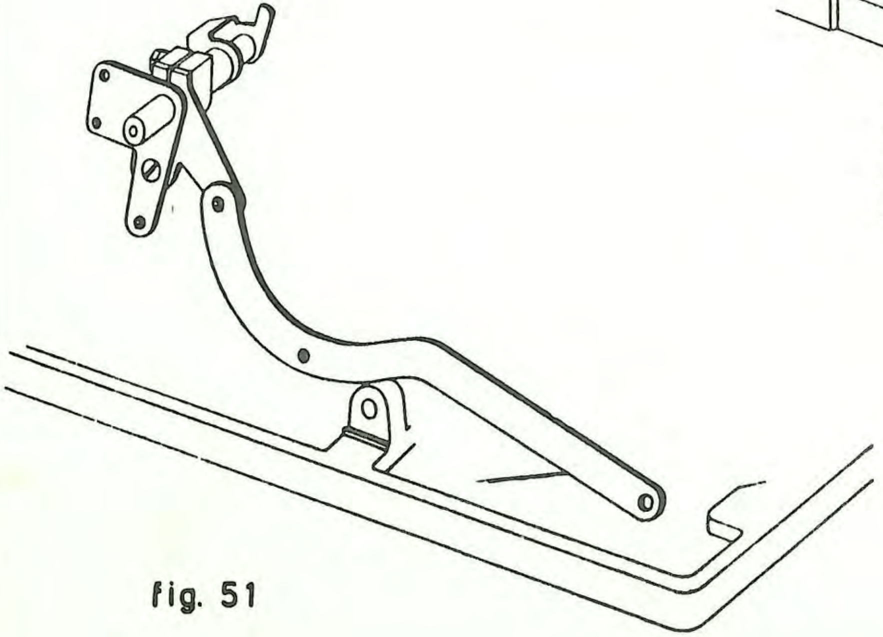


fig. 51

## 47 - Assembling the outer right side frame.

**MC 14 D - M - E** (Figures 52 and 52a)

*a*) Place the right outer side frame of the machine in position so that the sides connecting column N3 A 7, the shaft N3 T 26 and main cam shaft are lodged in their respective openings. The slide return hook lever N3 EN 3 should be placed on the fork of the slide return arm N3 EN 9 (figure 52).

*b*) Clamp the right outer side frame of the machine to the base with two screws N3 A 9 and their nuts 138505. Screw a nut 138405 all the way down on the threaded part of the column N3 A 7 which projects from the side (figure 52).

*c*) Hook spring N3 H 47 to the tens recharge bar control lever N3 ED 26 (figure 52a).

*d*) Hook spring N3 R 20 to the small plate of the base N3 H 45 (figure 52a).

e) Hook spring N3 N 22 to the spring holder of the lever N3 EN 3.

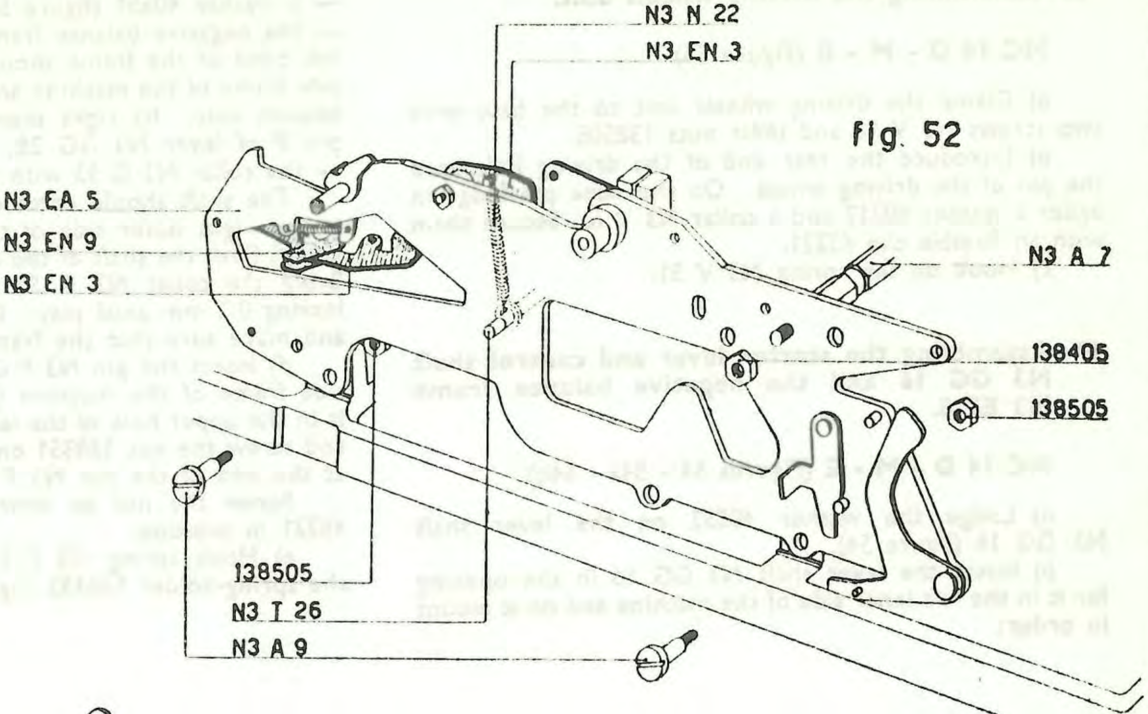


Fig. 52

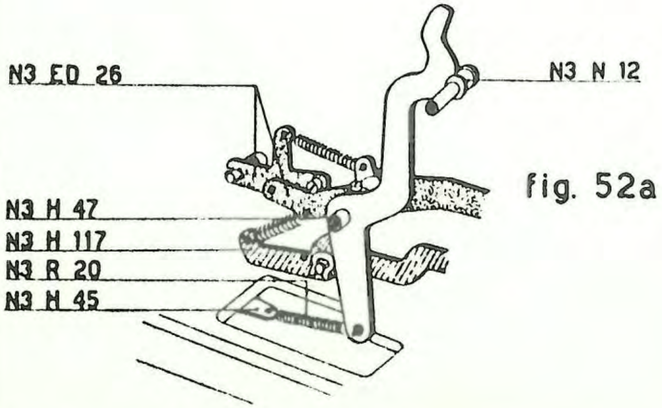


fig. 52a

## *48 - Assembling the driving wheels unit.

MC 14 D - M - E (Figure 53)

*a*) Clamp the driving wheels unit to the base with two screws N3 V 18 and their nuts 138505.

*b*) Introduce the rear end of the driving link onto the pin of the driving wheel. On the same pin lodge in order a washer 40312 and a collar N3 V 6. Secure them with an flexible clip 45221.

*c*) Hook on the spring N3 V 51.

## 49 - Assembling the starter lever and control shaft N3 GG 16 and the negative balance frame N3 EF 8.

MC 14 D - M - E (Figures 54 - 54a - 54b).

*a*) Lodge the washer 40552 on the lever shaft N3 GG 16 (figure 54).

*b*) Insert the lever shaft N3 GG 16 in the opening for it in the left inner side of the machine and on it mount in order:

— a washer 40551 (figure 54);

— the negative balance frame N3 EF 8 (figure 54a). The left bend of the frame should be between the left inner side frame of the machine and the lever **L** of the negative balance unit. Its right shank should be in front of the pin **P** of lever N3 GG 28;

— the collar N3 G 53 with its screw 120262 (figure 54a).

The shaft should come out through the proper hole in the right outer side of the machine (figure 54a).

*c*) Push the shaft of the lever N3 GG 16 to the right. Bring the collar N3 G 53 against the frame N3 EF 8, leaving 0.2 mm axial play. Clamp the collar to the shaft and make sure that the frame is free to rotate.

*d*) Insert the pin N3 F 6 in the slot of the left inner side frame of the machine (figures 54a and 54b). Lodge it in the upper hole of the left bend of the frame N3 EF 8 and screw the nut 138351 onto it. The lever **L** is lodged at the end of the pin N3 F 6.

Screw the nut on thoroughly. Put a flexible clip 45221 in position.

e) Hook spring N3 F 13 between pin N3 F 6 and the spring-holder 136352 (figure 54b).

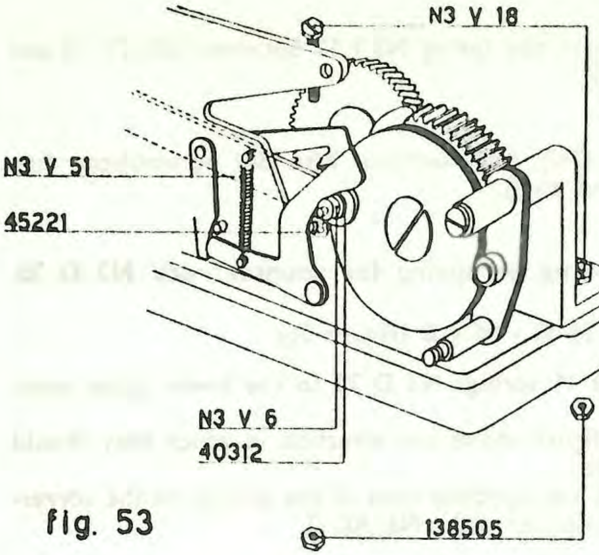


fig. 53

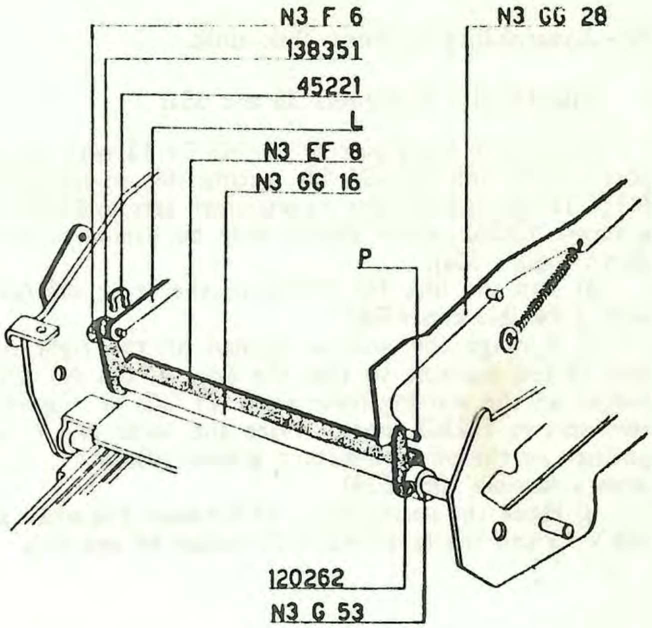


fig. 54a

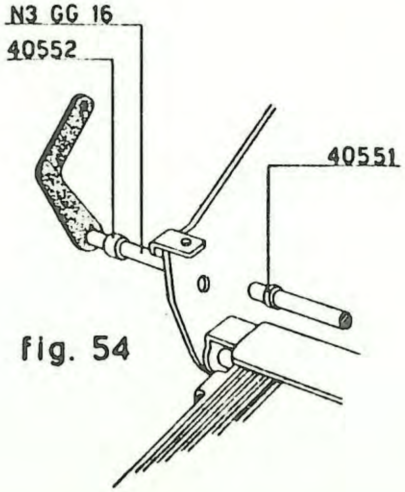


fig. 54

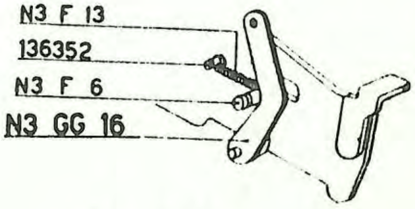


fig. 54b

## 50 - Assembling current link unit.

**MC 14 M - E** (Figures 55 and 55a)

*a*) Join the front part of the N3 EV 12 with the rear part of the link N3 EV 14, placing the adjusting plate N3 V 15 in between; secure with two screws 120261 and a screw 120262 which should only be partially screwed down (figure 55a).

*b*) Join the link N3 EV 12 to the lever N3 GV 13 with a flexible clip 45281.

*c*) Arrange the unit so formed on the right outer side of the machine so that the boss of the N3 GV 13 lodges on the starting lever shaft N3 GG 16. Leave the two screws 122302 loose. Place the lever N3 V 14 in position on the pin of the starting lever N3 EV 11. Secure with a flexible clip 45281.

*d*) Hook the spring N3 T 45 between the small plate N3 V 15 and the lever N3 V 10 rivited to the side.

e) Hook the spring N3 I 11 between N3 GV 13 and N3 EV 12.

**50 bis** - Only for machines with 36° accumulator (see second part).

## 51 - Hooking on spring for counter rack N3 D 20.

**MC 14 D - M - E** (Figure 56)

Hook 11 springs N3 D 20 to the lower guide comb N3 D 9.

The figure shows the direction in which they should be hooked.

Hook the opposite ends of the springs to the corresponding counter racks N3 AD 2.

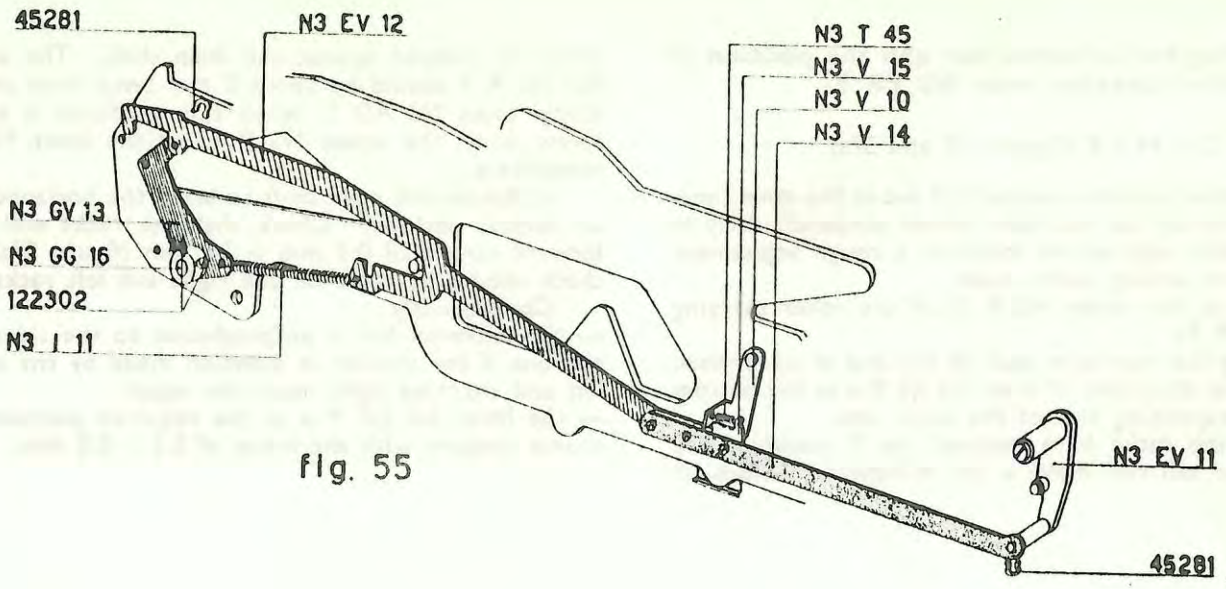


fig. 55

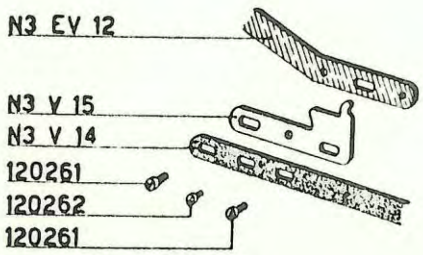


fig. 55a

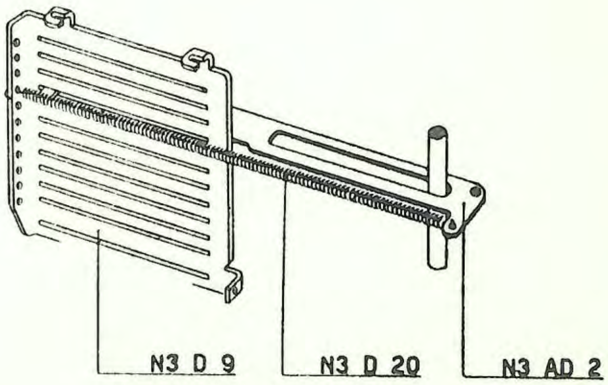


fig. 56

## 52 - Adjusting the universal bar and the position of the roller carrying lever N3 ER 9.

**MC 14 D - M - E** (Figures 57 and 57a)

The two adjustments are carried out at the same time.

The universal bar has been placed perpendicularly in relation to the sides of the machine; a rough adjustment has therefore already been made.

*a*) Loosen the screw N3 R 15 of the roller carrying lever N3 ER 9.

*b*) Bring the main cam shaft to the end of its forward stroke so that the roller of lever N3 ER 9 is at the bottom of the corresponding slot of the main cam.

When the racks have reached the 9 position, the universal bar can still move a few millimeters before its arms are stopped against the main shaft. The universal bar N3 R 7 should be about 2 mm away from the horizontal racks N3 AD 2; when this condition is obtained screw down the screw N3 R 15 of the lever N3 ER 9 completely.

c) Rotate the main shaft to bring the horizontal racks to normal position. Check that the racks still have a forward stroke of 0.3 mm ÷ 0.5 mm (figure 57a). This check should be made on the right and left racks.

Consequently:

— the universal bar is perpendicular to the sides of the machine if the strokes in question made by the extreme left and extreme right racks are equal;

— the lever N3 ER 9 is in the required position if the course remains with the limits of 0.3 ÷ 0.5 mm.

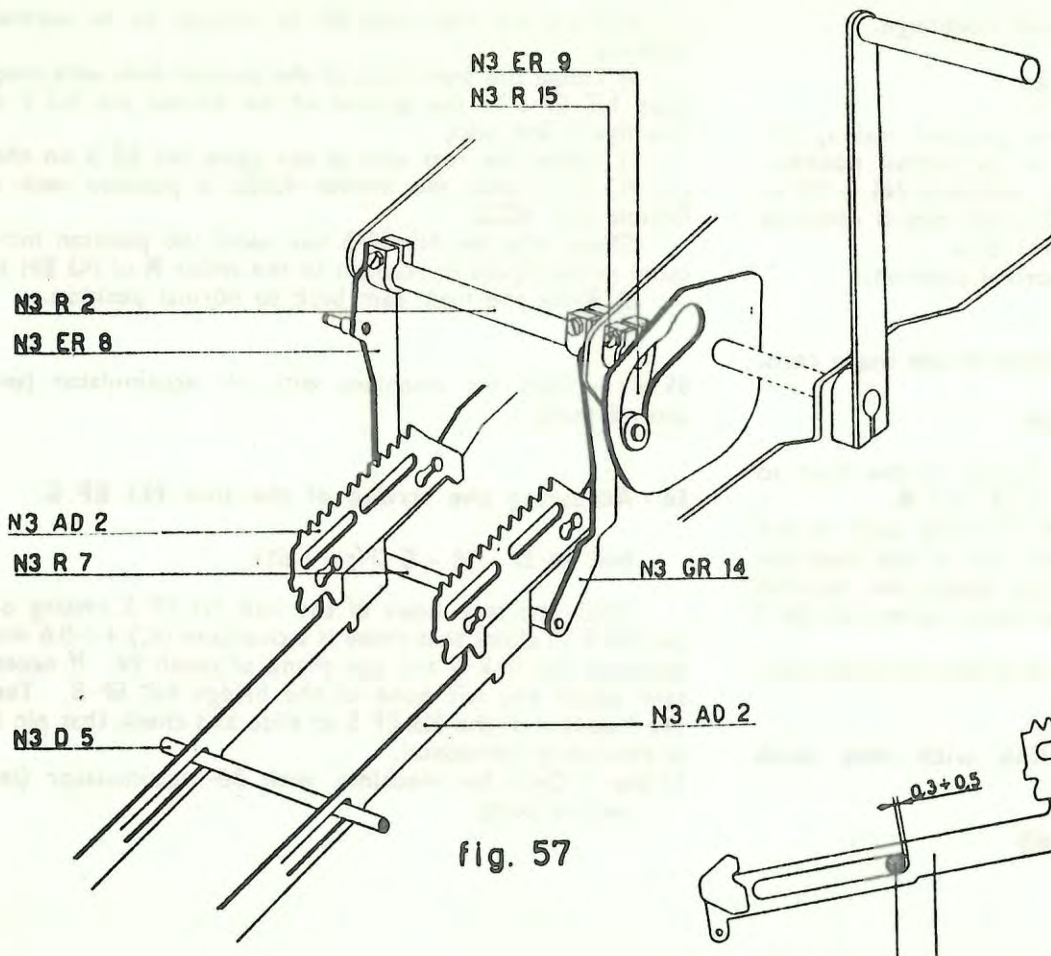


fig. 57

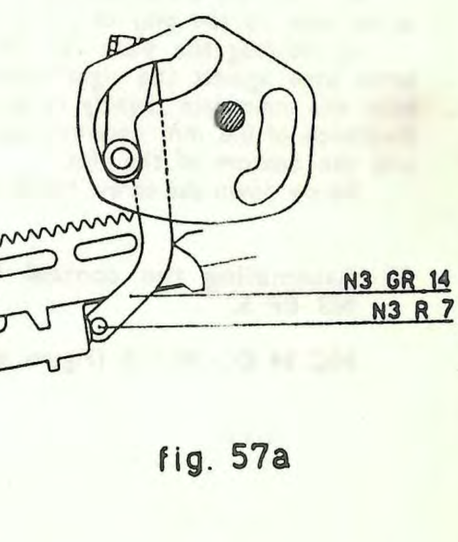


fig. 57a

### 53 - Adjusting transmission lever recharge.

**MC 14 D - M - E** (Figure 58)

*a*) Bring the racks to the nine position making the main cam rotate 90° in relation to its normal position.

*b*) Adjust the position of the eccentric N3 B 32 so that the required clearance of 0.7 ÷ 0.9 mm is obtained between the N3 GD 4 and the N3 D 6.

Bring the machine back to normal position.

### 54 - Adjusting the normal position of the main cam.

**MC 14 D - M - E** (Figure 59)

*a*) Turn the plate N3 GR 1 slightly to the front so as to take up the play of the pins **A** and **B**.

*b*) Holding the plate N3 GR 1 steady (and at the same time against the right outer side of the machine) turn the main cam slightly so as to obtain the required clearance of 0.6 mm between the lever roller N3 ER 9 and the bottom of the slot.

Screw down the screw N3 R 15 of the plate N3 GR 1.

### 55 - Assembling the control link with stop hook N3 EF 5.

**MC 14 D - M - E** (Figure 60)

*a*) Turn the main cam 90° in relation to its normal position.

*b*) Lodge the front fork of the control link with stop hook N3 EF 5 in the groove of the double pin N3 F 6 (see figure 54b also).

c) Lodge the rear slot of the same N3 EF 5 on the pin N3 F 7; place the washer 40322 in position with a flexible clip 45221.

Check that the N3 EF 5 has taken the position indicated in the figure in relation to the roller **R** of N3 EH 1.

*d*) Bring the main cam back to normal position.

**55 bis** - Only for machines with 36° accumulator (see second part).

### 56 - Adjusting the stroke of the link N3 EF 5.

**MC 14 D - M - E** (Figure 61).

With the stop hook of the link N3 EF 5 resting on pin N3 F 10 check that there is a clearance of 0.4 ÷ 0.6 mm between the link **S** and the shank of tooth **N**. If necessary adjust the left bend of the bridge N3 EF 8. Test the freedom of the N3 EF 5 to slide and check that pin **P** is absolutely horizontal.

**56 bis** - Only for machines with 36° accumulator (see second part).

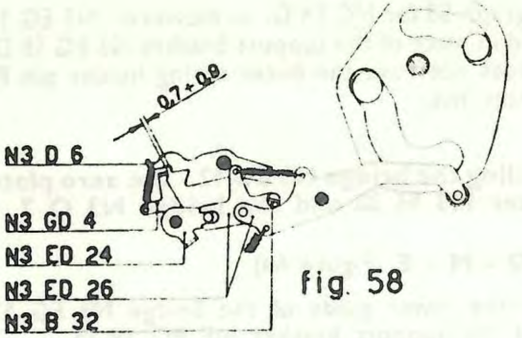


fig. 58

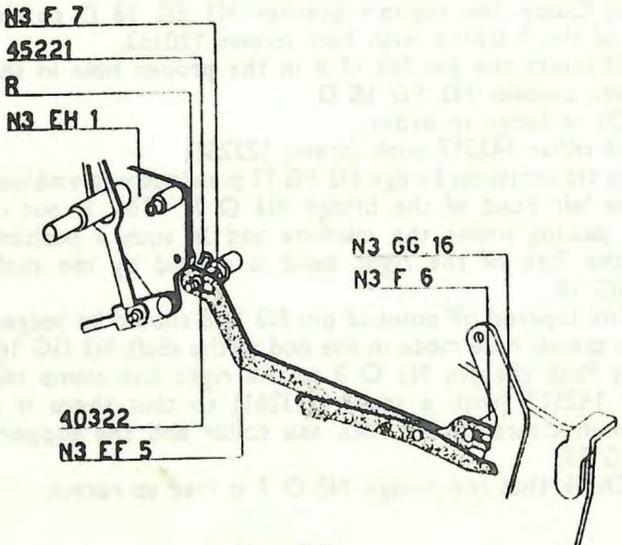


fig. 60

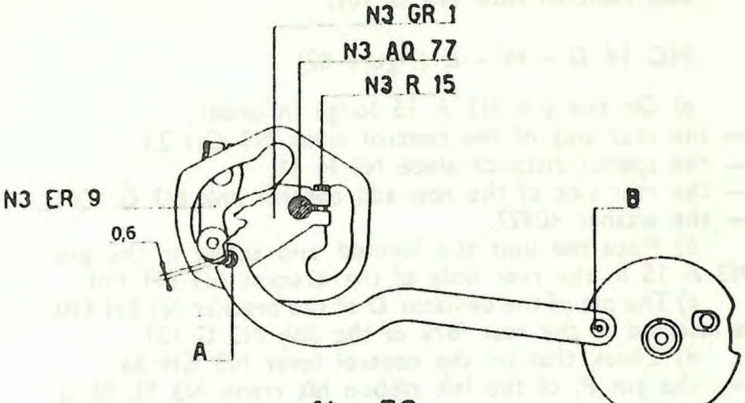


fig. 59

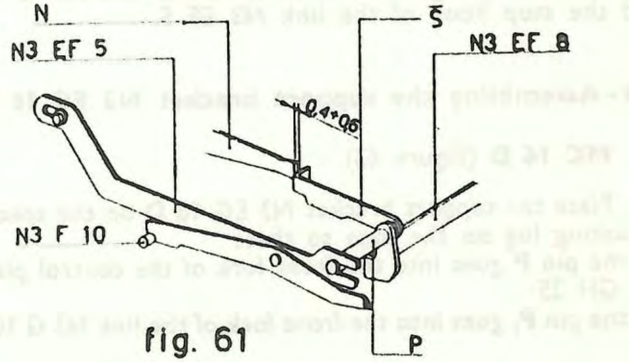


fig. 61

### *57 - Assembling control lever N3 GH 25 and non add control link N3 G 107.

#### MC 14 D - M - E (Figure 62)

*a*) On the pin N3 A 15 lodge in order:
— the rear slot of the control lever N3 GH 25;
— the special distance piece N3 H 41;
— the rear slot of the non add control link N3 G 107;
— the washer 40427.

*b*) Place the unit this formed and screw in the pin N3 A 15 in the rear hole of the bracket N3 EH 110.

c) The pin of the deviator **D** of the bracket N3 EH 110 is inserted in the rear fork of the link N3 G 107.

*d*) Check that on the control lever N3 GH 25:
— the pin $P_1$ of the left ribbon lift crank N3 EL 26 is lodged on fork 1;
— the pin $P_2$ of the anchor lift lever N3 EH 12 is lodged in slot 2;
— the pin $P_3$ of the wheels stop comb N3 GH 121 is lodged in slot 3.

e) Secure pin N3 A 15 with a nut 138405.

*f*) Hook spring M2 E 28 between the link N3 G 107 and the stop hook of the link N3 EF 5.

### *58 - Assembling the support bracket N3 EG 18 D.

#### MC 14 D (Figure 63)

Place the support bracket N3 EG 18 D on the special mounting lug on the base so that:
— the pin **P** goes into the front fork of the control plate N3 GH 25:
— the pin $P_1$ goes into the front fork of the link N3 G 107.

#### MC 14 M - E

See paragraph 58 for MC 14 D. — However, N3 EG 18 should be used in place of the support bracket N3 EG 18 D. The former does not have the outer spring holder pin $P_2$ which the latter has.

### *59 - Assembling the bridge N3 EG 12 - the zero plate lift rocker N3 H 38 and the bridge N3 O 7.

#### MC 14 D - M - E (Figure 64)

*a*) Lodge the lower guide of the bridge N3 EG 12 in the slot of the support bracket NE EG 18 D.

*b*) Place the rocker N3 H 38 in position between the pin of the support bracket N3 EG 18 D and the pin of comb N3 ED 8 so that the front pin of the control lever N3 GH 25 lodges in its upper slot.

c) Clamp the support bracket N3 EG 18 D to the base of the machine with two screws 120352.

*d*) Insert the pin N3 O 8 in the proper hole in the support bracket N3 EG 18 D.

On it lodge in order:
— the collar 142517 with screws 123261;
— the transmission bridge N3 EG 12 previously assembled;
— the left bend of the bridge N3 O 7. This is put in place passing under the machine and in such a position that the fork of the right bend is guided by the shaft N3 GG 16.

The tapered off point of pin N3 O 8 should be lodged in the special hole made in the end of the shaft N3 GG 16.

e) Push the pin N3 O 8 to the right and clamp the collar 142517 (with a screw 123261) so that there is a minimum clearance between the collar and the support N3 EG 18.

Check that the bridge N3 O 7 is free to rotate.

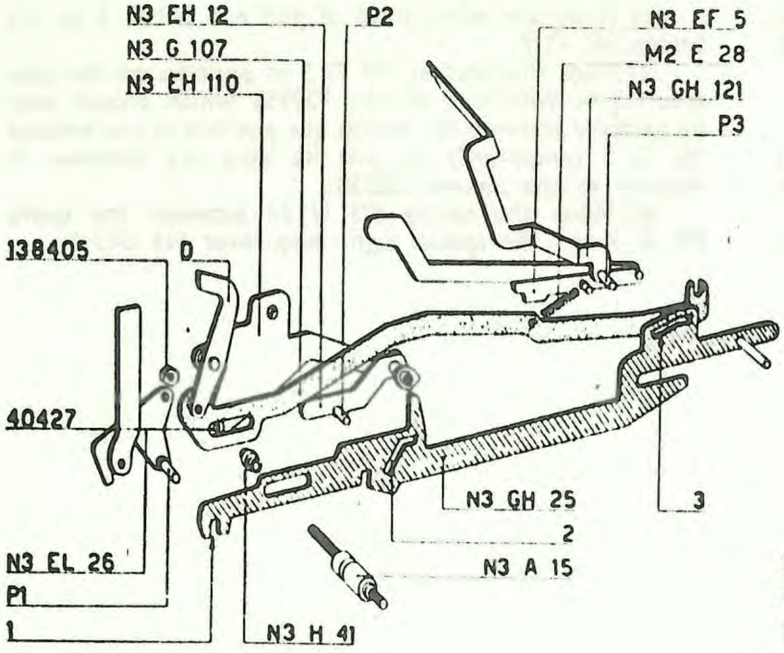


fig. 62

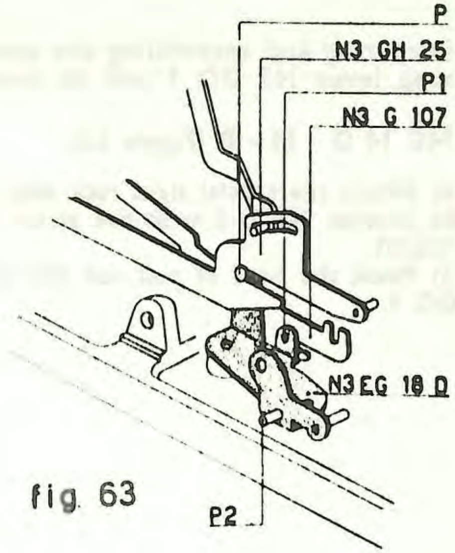


fig. 63

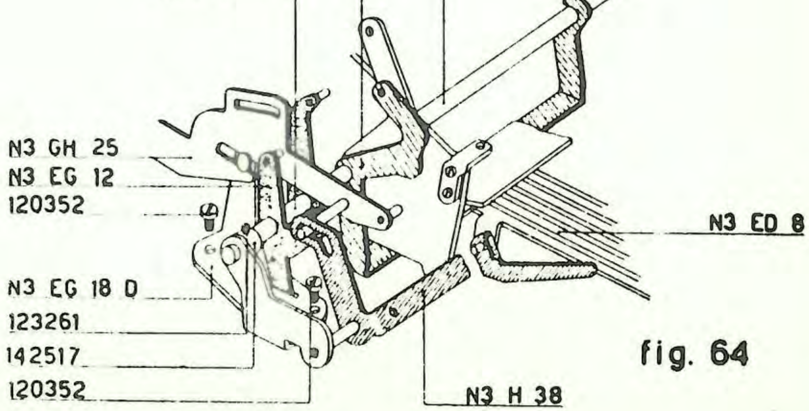


fig. 64

## 60 - Preparing and assembling the special signs rack stop lever N3 GO 1 and its bracket N3 O 5.

### MC 14 D - M - E (Figure 65)

*a*) Attach the special signs rack stop lever N3 GO 1 to the bracket N3 O 5 with the screw 1263538 and its nut 138351.

*b*) Hook the head of pull rod N3 O 6 to the lever N3 GO 1.

*c*) Hook the other head of pull rod N3 O 6 to the bridge N3 O 7.

*d*) Place the bracket N3 O 5 in position on the base securing it with two screws 120353 which should only be partially screwed in. Adjust the position of the bracket N3 O 5 temporarily so that its slots are centered in relation to the screws 120353.

*e*) Hook the spring N3 U 34 between the comb N3 D 9 and the special signs stop lever N3 GO 1.

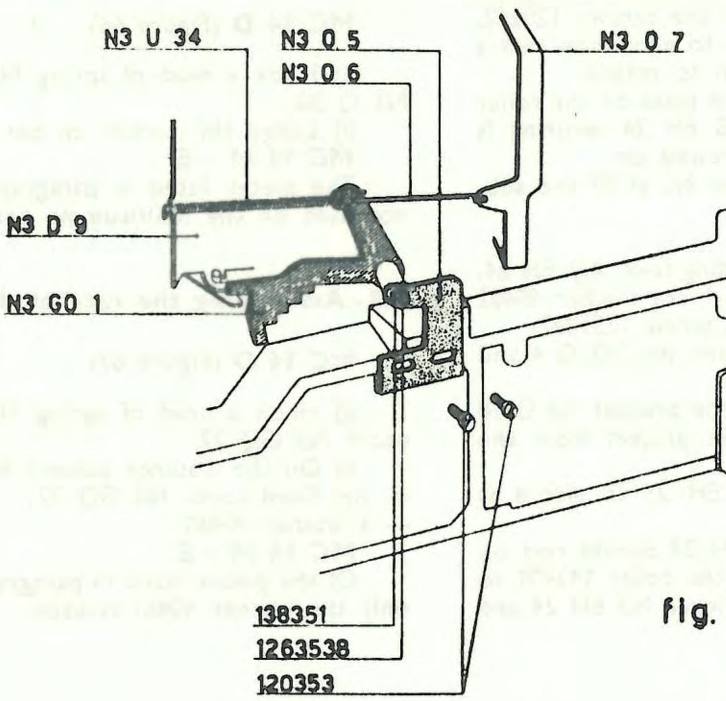


fig. 65

## *61 - Assembling the ovoid cam N3 GH 22 - The roller holding lever for cam N3 EH 24 and the motor hook shut off lever N3 G 4.

**MC 14 D - M - E** (Figure 66)

*a*) Lodge the ovoid cam N3 GH 22 and the collar 142517 on the shaft N3 H 26 with the screws 120262. Attach the collar to the shaft so as to allow the cam a slight axial play and perfect freedom to rotate.

*b*) Put the special pin N3 H 128 in place on the roller holding lever for the ovoid cam N3 EH 24 securing it with a nut 138261 only partially screwed on.

c) Screw a nut 138351 on the pin N3 H 29 and subsequently lodge in order:

— the distance collar 40409;

— the unit formed by the roller holding lever N3 EH 24, the motor hook shut off lever N3 G 4, the washer 40402 and the collar 142401; secure with a screw 1253022.

Hook the spring N3 V 52 between the N3 G 4 and the roller holding lever N3 EH 24.

*d*) Screw the pin N3 H 29 onto the bracket N3 D 18 so that only two threads of the pin project from the inside. Screw down the nut 138351.

Make sure that the lever N3 EH 24 is placed as shown in the figure.

e) The roller of the lever N3 EH 24 should rest on the edge of the ovoid cam. Secure the collar 142401 to the pin N3 H 29 so as to allow the lever N3 EH 24 and N3 G 4 a small degree of play.

*f*) Hook the head of the spring N3 H 48 to the roller holding lever N3 EH 24.

## *62 - Assembling the rocker for hooking the main lever N3 Q 30.

**MC 14 D** (Figure 66)

*a*) Hook a head of spring N3 M 121 to the rocker N3 Q 30.

*b*) Lodge the rocker on pin N3 H 29.

**MC 14 M - E**

The pieces listed in paragraph 62 for MC 14 D are not used on the multisumma nor on the elettrosumma.

## *63 - Assembling the ratchet detent N3 GQ 27.

**MC 14 D** (Figure 67)

*a*) Hook a head of spring N3 H 6 on to the fixed tooth N3 GQ 27.

*b*) On the distance column N3 A 15 lodge:

— the fixed tooth N3 GQ 27;

— a washer 40461.

**MC 14 M - E**

Of the pieces listed in paragraph 63 for the MC 14 D, only the washer 40461 is used.

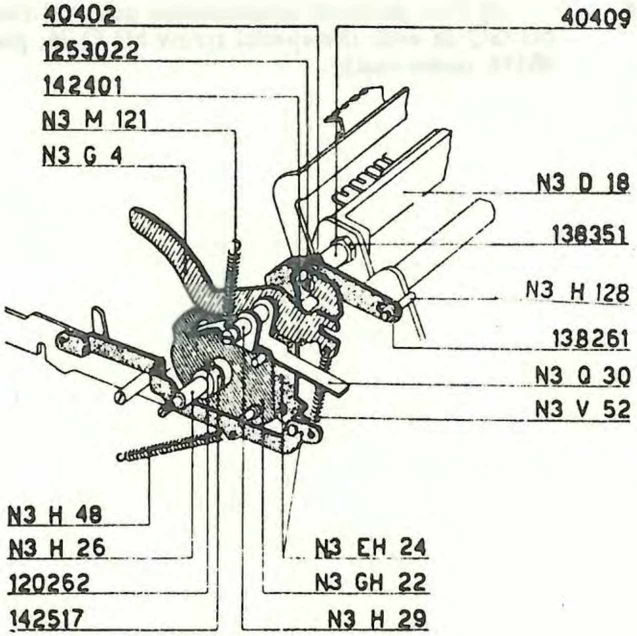

40402
1253022
142401
N3 M 121
N3 G 4
40409
N3 D 18
138351
N3 H 128
138261
N3 Q 30
N3 V 52
N3 H 48
N3 H 26
120262
142517
N3 EH 24
N3 GH 22
N3 H 29

fig. 66

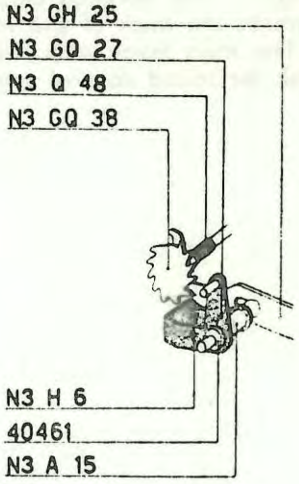

N3 GH 25
N3 GQ 27
N3 Q 48
N3 GQ 38
N3 H 6
40461
N3 A 15

fig. 67

## •64 - Preparing the left outer side N3 A 2.

### MC 14 D (Figure 68)

On the left outer side of the machine N3 A 2 attach:

*a*) the guide pin of the correction key N3 G 9 with its nut 138351. The bevelled part of the pin should be turned towards the back of the machine.

*b*) — The main lever with rollers N3 EQ 31;

— the hook for sound control arm N3 Q 36;

— the lever of control anchor N3 EH 34 with the special stud N3 Q 106 and support bushing N3 Q 21.

Hook the spring N3 G 51 between the hook N3 Q 36 and the main lever N3 EQ 31.

*c*) The lever N3 GH 36 by means of the stud 1263541 and its nut 138351.

*d*) The quotient accumulation pull rod shut off detent N3 GQ 28 with the special screw N3 Q 26, placing washer 40316 underneath.

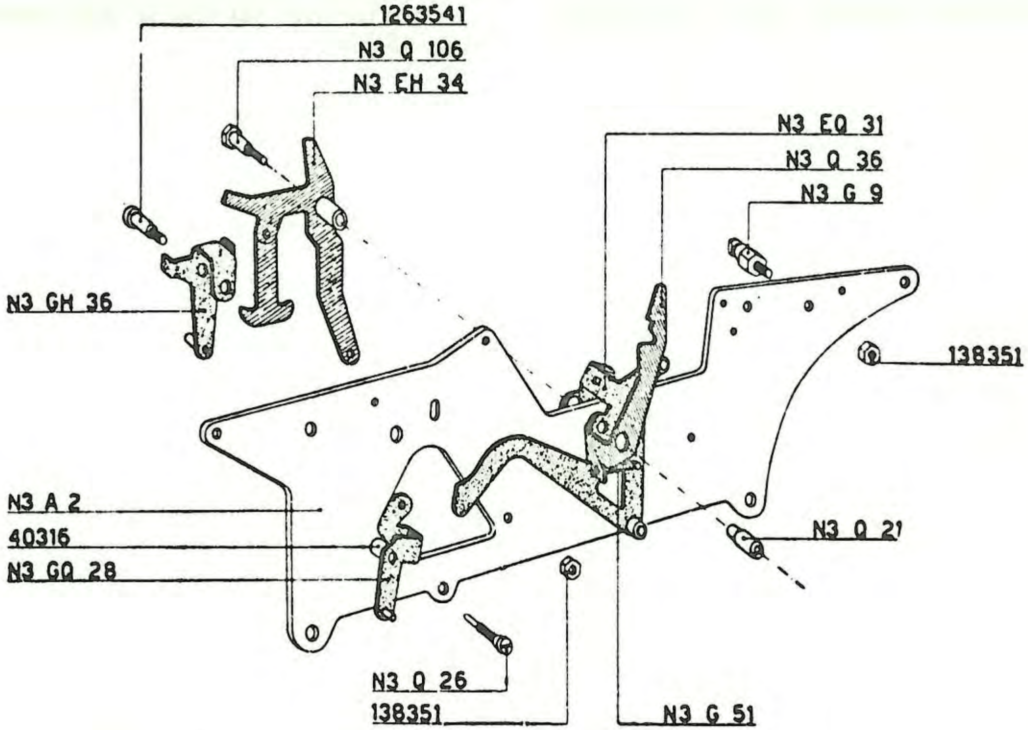

1263541
N3 Q 106
N3 EH 34
N3 EQ 31
N3 Q 36
N3 G 9
N3 GH 36
138351
N3 A 2
40316
N3 GQ 28
N3 Q 21
N3 Q 26
138351
N3 G 51

fig. 68

### MC 14 M - E (Figure 69)

On the left outer side frame of the machine N3 A 2 attach:

*a*) The correction key guide pin N3 G 9 with its nut 138351.

The bevelled part of the pin should be turned towards the back of the machine.

*b*) The anchor control lever N3 EH 34 with a special screw 1263538 and its nut 138351.

*c*) The lever N3 GH 36 with screw 1263541 and its nut 138351.

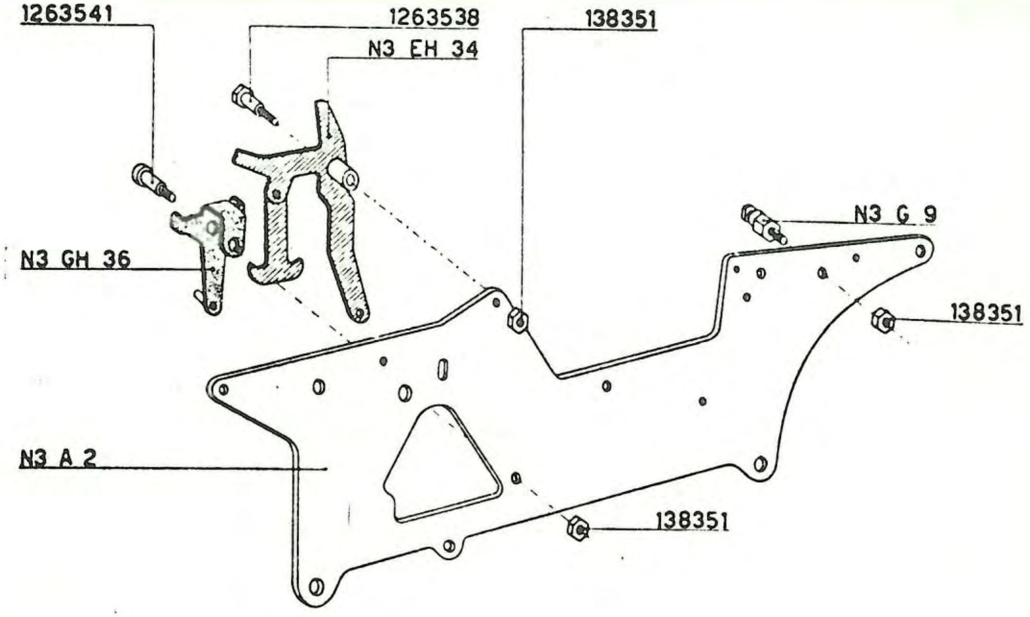

1263541
1263538
N3 EH 34
138351
N3 G 9
138351
N3 GH 36
N3 A 2
138351

fig. 69

## •65 - Assembling the left outer side frame N3 A 2.

**MC 14 D** (Figures 70 - 70a - 70b - 70c - 70d - 70e - 70f)

Place the left outer side frame of the machine in position taking care that:

*a*) The sides connecting column N3 A 6, the distance column N3 A 15 and the pins N3 H 29, N3 H 37 and N3 H 26 are lodged in the corresponding guide holes in the side frame itself (figure 70).

*b*) The spring N3 M 121 of the rocker N3 Q 30 is turned upwards (figure 70).

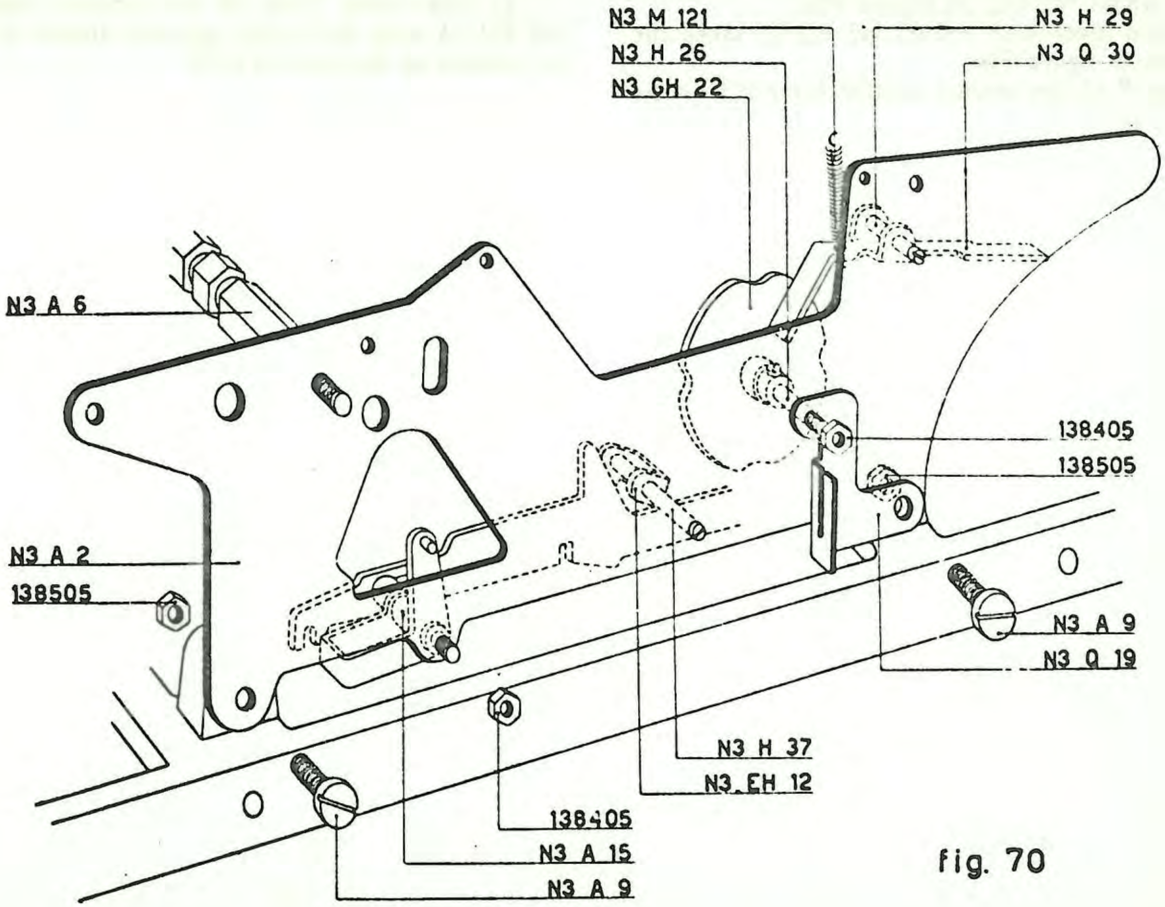

N3 M 121
N3 H 26
N3 GH 22
N3 H 29
N3 Q 30
N3 A 6
138405
138505
N3 A 2
138505
N3 A 9
N3 Q 19
N3 H 37
N3 EH 12
138405
N3 A 15
N3 A 9

fig. 70

*c)* The tapered point of the special pin N3 Q 26 is inserted into the hole in the end of the shaft of the quotient accumulation wheel N3 GQ 38 (figure 70a).

*d)* The main lever with rollers N3 EQ 31 takes the position shown in figure 70b.

e) The pin **P** of the anchor control lever N3 EH 34 is inserted into the hole in the end of the roller carrying lever N3 EH 24 (figure 70c).

*f)* The lower part of the anchor control lever N3 EH 34 must be in the position shown in figure 70c in relation to the pin N3 H 37.

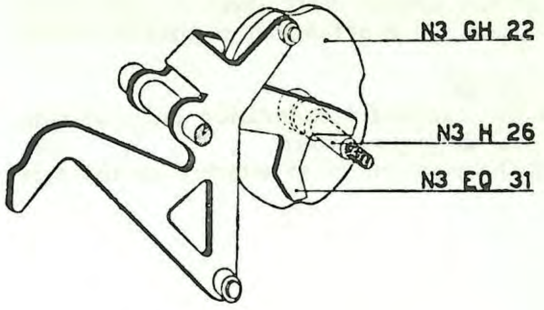


fig. 70b

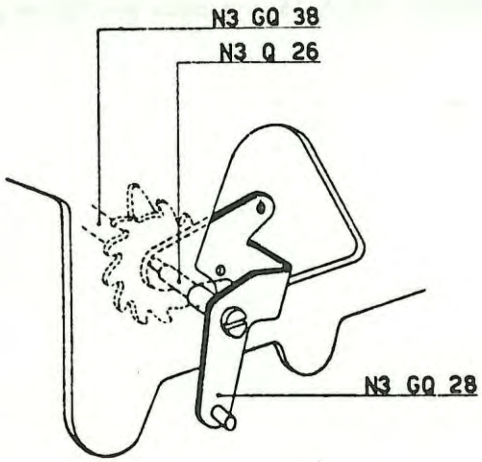


fig. 70a

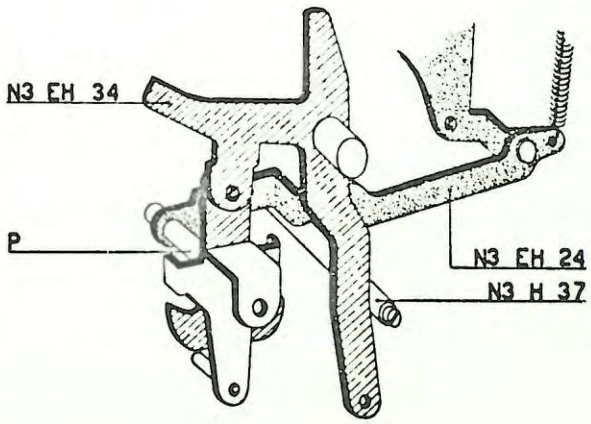


fig. 70c

g) Pin **P** of the control plate lever N3 GH 36 is inserted in the special slot **A** of the control plate N3 GH 25 (figure 70d).

Hook the springs:
— N3 H 6 to the quotient accumulation pull rod shut off detent N3 GQ 28 (figure 70e);
— N3 H 48 to the plate N3 H 45 attached to the base of the machine (figure 70f).

When these conditions have been obtained, place the guide bracket N3 Q 19 in position on the outer side (figure 70); clamp the side to the base of the machine with:
— two screws N3 A 9 and their nuts 138505;
— two nuts 138405 which are screwed respectively onto the distance column N3 A 15 and onto pin N3 H 26.

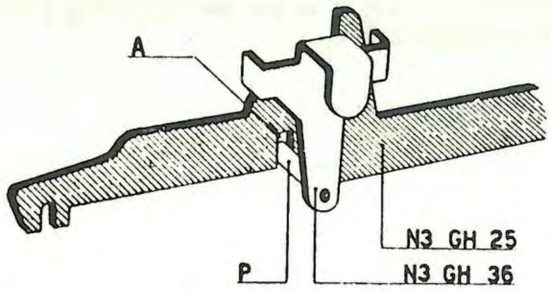


fig. 70d

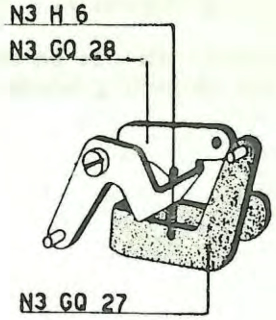


fig. 70e

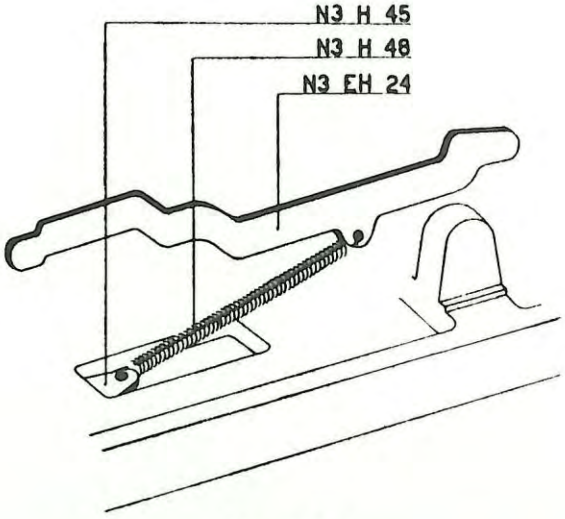


fig. 70 f

### MC 14 M - E (Figures 71 - 71a - 71b - 71c)

Place the outer left side on the machine so that:
*a*) The sides connecting column N3 A 6, the distance column N3 A 15 and the pins N3 H 29, N3 H 37 and N3 H 26 are lodged in the corresponding guide holes in the side (figure 71).

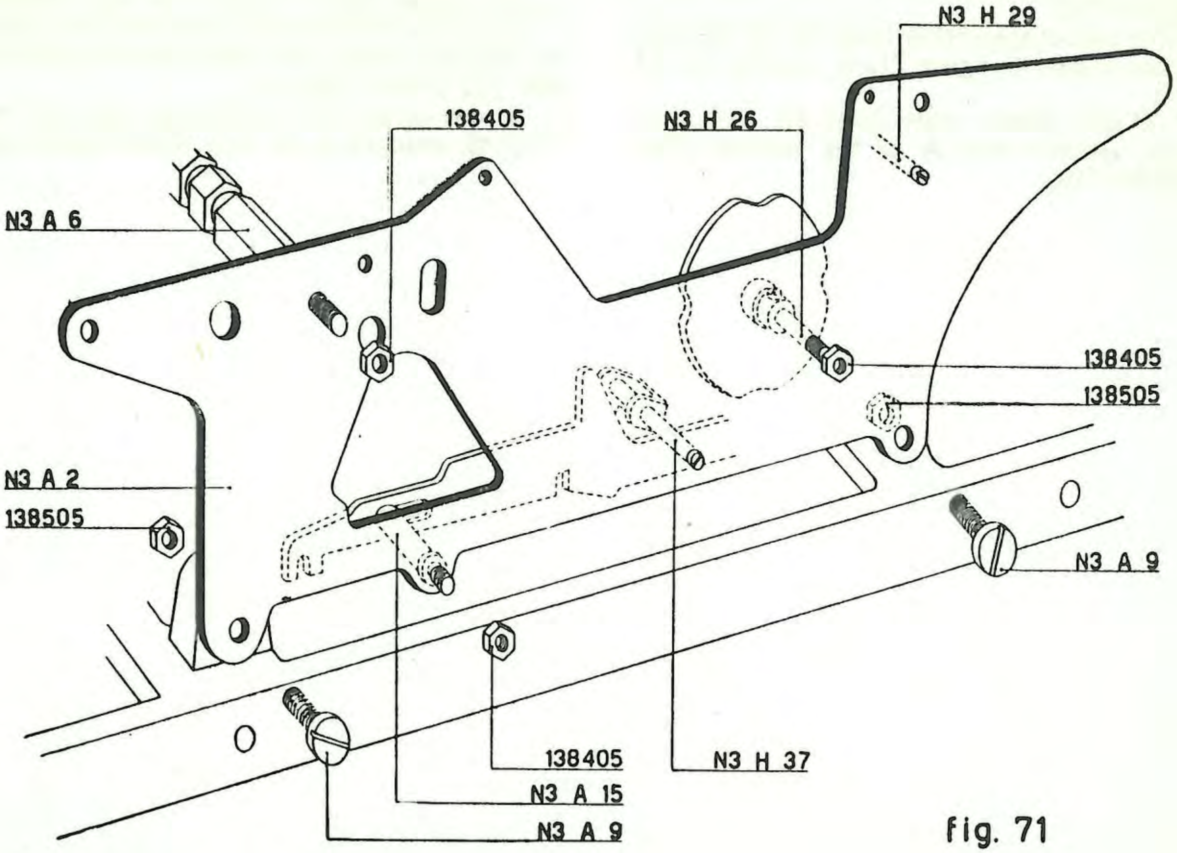

N3 H 29
138405
N3 H 26
N3 A 6
138405
138505
N3 A 2
138505
N3 A 9
138405
N3 H 37
N3 A 15
N3 A 9

fig. 71

*b*) Pin **P** of the anchor control lever N3 EH 34 goes into the hole in the end of the roller carrying lever N3 EH 24 (figure 71a).

*c*) The lower part of the anchor lever N3 EH 34 must take the position shown in figure 71a in relation to pin N3 H 37.

*d*) Pin **P** of the control plate lever N3 GH 36 is inserted in the apposite slot **A** of the control plate N3 GH 25 (figure 71b).

When these conditions have been obtained, clamp the side to the base of the machine with (figure 71):

— two screws N3 A 9 with their nuts 138505;

— three nuts 138405 which are screwed respectively onto the distance column N3 A 15, onto the pin N3 H 26 and onto the column N3 A 6.

Hook spring N3 H 48 to the plate for the purpose N3 H 45, attached to the base of the machine (figure 71c).

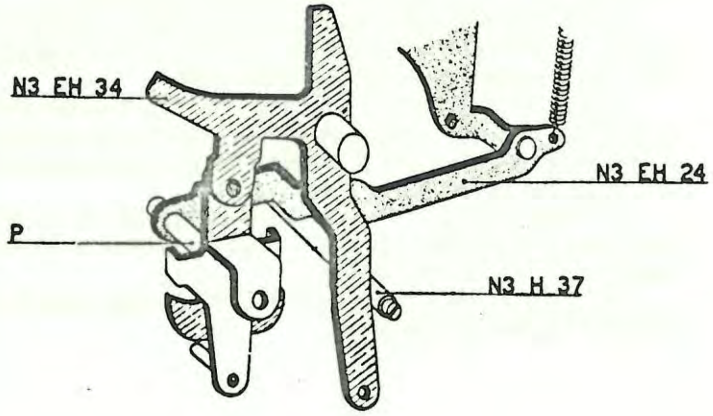


fig. 71a

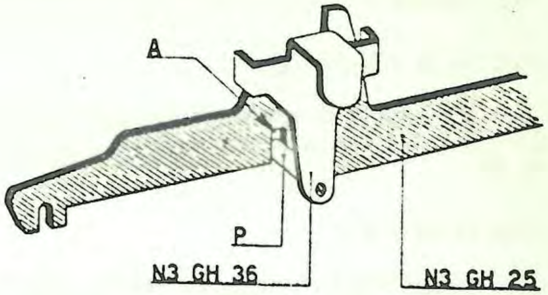


fig. 71b

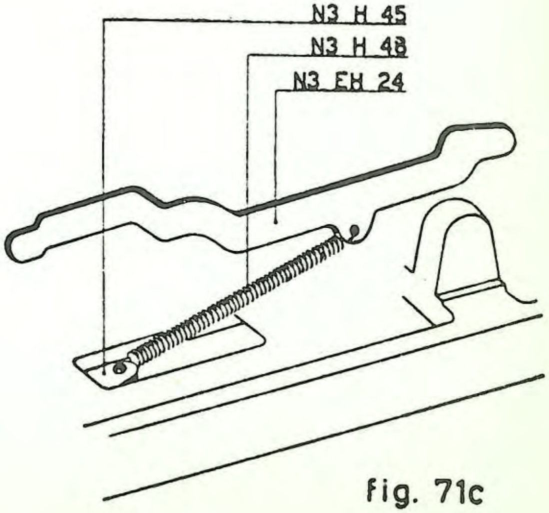


fig. 71c

## 66 - Assembling the total control recharge cam lever N3 GQ 87.

### MC 14 D (Figure 72)

Clamp the totals control recharge cam lever N3 GQ 87 on the column N3 A 6 by means of the proper bushing N3 Q 89.

### MC 14 M - E

The pieces listed in paragraph 66 for MC 14 D are not used for the Multisumma nor for the Elettrosumma.

## 67 - Assembling the slide.

### MC 14 D - M - E (Figure 73)

*a*) Place the cancellation plate N3 N 14 in position on the base with a screw 125357. Above the plate put the shock absorber leaf spring N3 EN 13, securing it with two screws 120354 which should only be partially screwed down. Screw in the 125357 completely.

*b*) Position the slide as shown in the figure; the roller of the arm N3 EN 9 should be inserted in the apposite slot in the upper plate of the slide itself.

Introduce the shaft N3 C 5 in the right outer side of the machine and passing it through the guide bushing of the slide, push it until it enters into the corresponding operning in the left outer side.

c) Clamp the guide roller bracket N3 EC 15 to the base with two screws 120352 so that the roller is in the position shown in the figure.

*d*) Hook a head of spring N3 C 17 to the hole **F** in the upper plate of the slide.

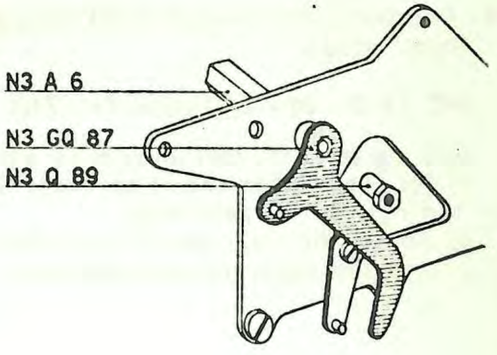
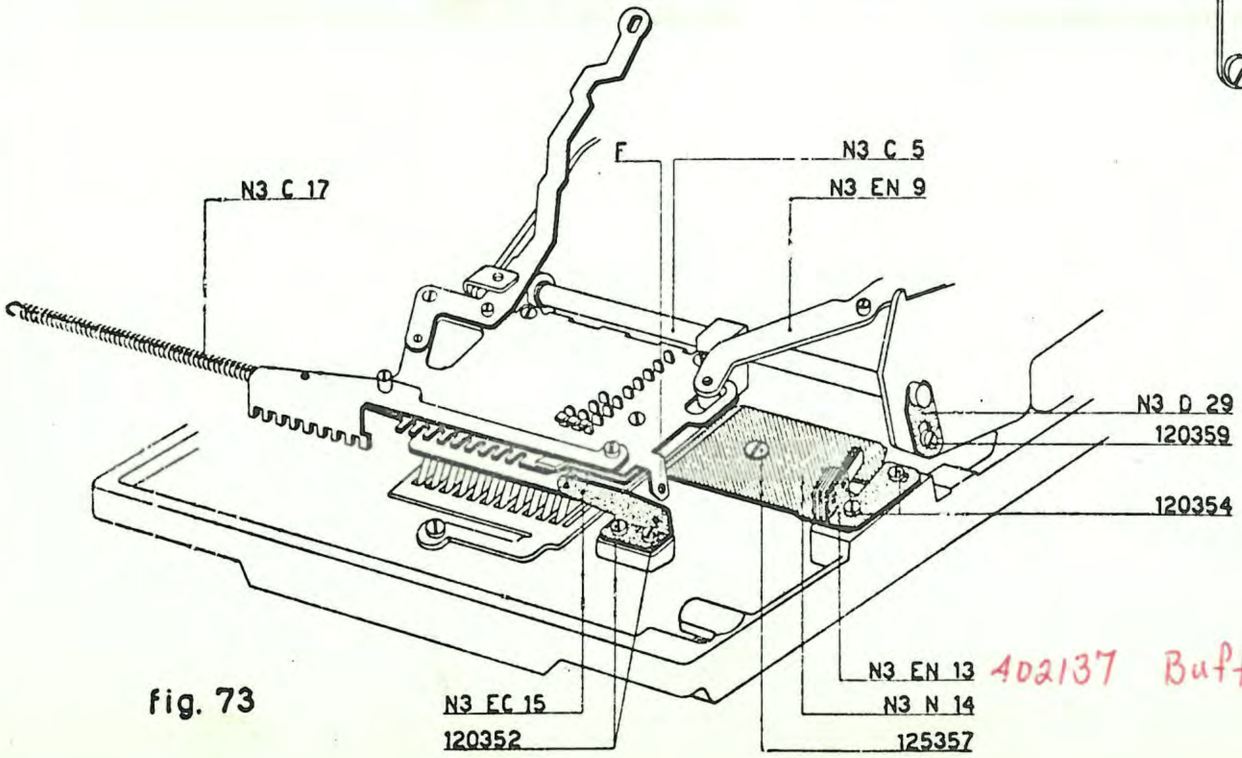


fig. 72



402137 Buffer Spring

fig. 73

### *68 - Adjusting the counter racks stop plate N3 D 28 (nines stop).

**MC 14 D - M - E** (Figures 74 - 74a)

*a*) Bring the slide to the extreme left.

*b*) Set every other one of the stops **S** of the eighth row and raise all the zero stops.

*c*) Rotate the main cam 90° so that the racks are brought to the eight and nine positions.

*d*) Adjust the position of the plate N3 D 28 by the eccentrics N3 B 38 so that the teeth of the rack which has reached the nine position are out of phase one pitch plus 0.1 mm in relation to the teeth of the rack which is stopped in the eight position (figure 74a).

If necessary, to make the adjustment more easily, slide out the shaft of the slide N3 C 5 partially.

When the adjustment has been made, secure the slide shaft N3 C 5 to the right outer side of the machine with the plate N3 D 29 and its screw 120359 (figure 73).

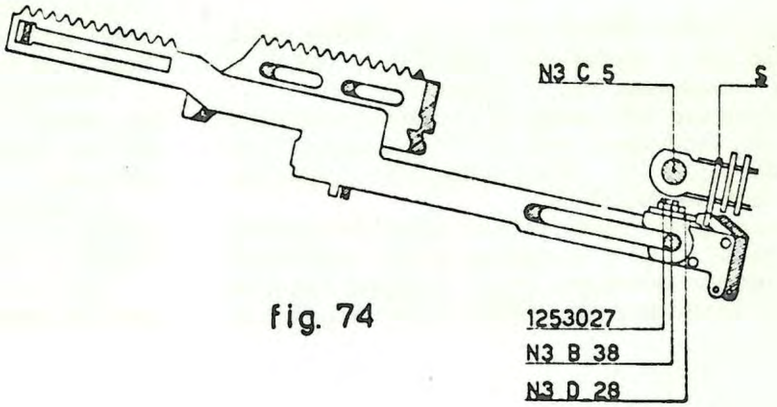


fig. 74

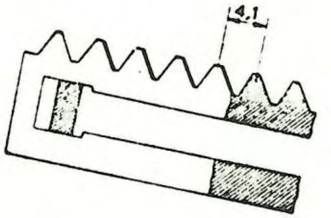


fig. 74a

## 69 - Assembling the escapement.

**MC 14 D - M - E** (Figures 75 - 75a - 76 - 76a - 77 - 78 - 79 - 80 - 81 - 82 - 83)

*a*) Screw a screw 124308 with its nut 138306 and a screw 1253028 and a second nut 138306 onto the fixed tooth of the escapement N3 I 1 (figure 7- .

*b*) Introduce the fixed tooth N3 I 1 and the stop plate N3 GI 9 on the escapement shaft N3 I 6 and secure with a screw 122302 (figure 75). Hook spring N3 I 12 between the N3 I 1 and the N3 GI 9.

c) By means of the screw 124308, adjust the position of the stop plate N3 GI 9 in relation to the fixed tooth N3 I 1. When the conditions shown in figure 75a have been reached, screw the nut 138306 all the way down.

*d*) Place a washer 40402 on the escapement shaft. Then lodge on it the movable tooth N3 I 2 on which has previously been placed the special pin N3 H 128 with its nut 138261 and washer 40292 (figure 76).

e) Check that the movable tooth projects 0.1 further than the fixed tooth (figure 76a). To reach these conditions add one, or at most, two washers 40419 (figure 76).

Through screw 1253028 adjust the distance between the movable tooth and the fixed tooth; it should be 0.8 mm (figure 76a). When the required conditions are obtained, screw down the nut 138306.

*f*) Lodge the control crank N3 GI 4 with its screw 120302 and the eccentric bushing N3 I 16 with its screw 122302 on the escapement shaft (figure 76).

N.B. — The escapement group has been modified (see Technical Information Bolletin n. 55-59).

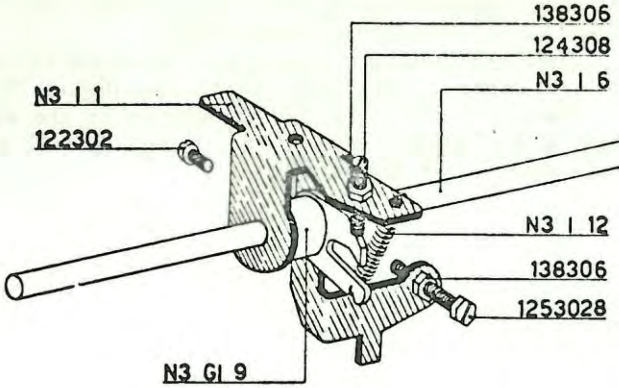


fig. 75

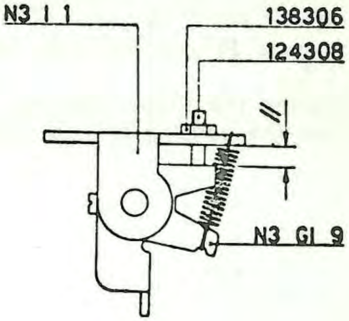


fig. 75a

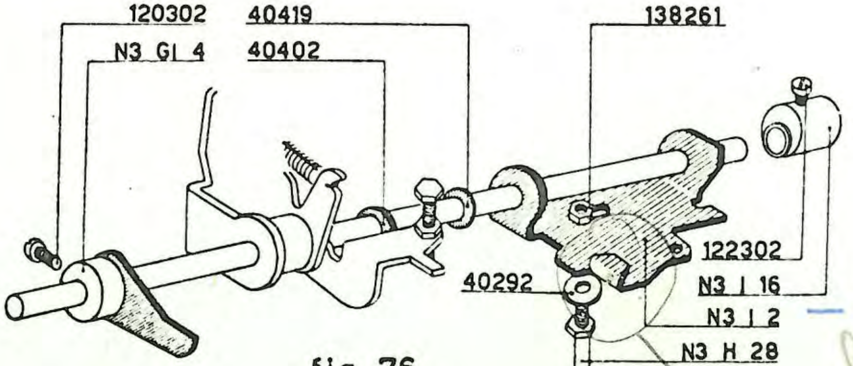


fig. 76

— 402105Y

Gebroken Springer Pull.

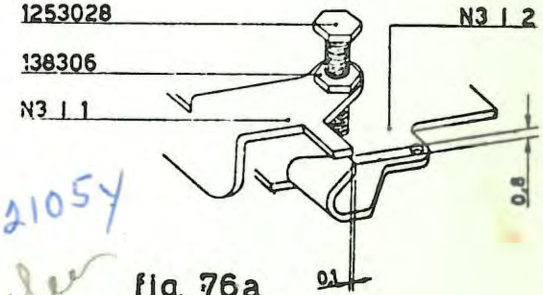


fig. 76a

*g*) Clamp the right bracket of the escapement N3 EI 8 to the base with two screws 120352. Lodge the stop lever of the mobile tooth N3 I 3 on the pin P of the N3 EI 8, securing it with a flexible clip 45281 (figure 77). Hook the spring N3 T 46 between the right side of the escapement (hole F) and the stop lever of the movable tooth N3 I 3.

*h*) Preparing the shock absorber unit.

Introduce the housing for the shock absorber spring N3 I 14 onto the right end of the escapement shaft, then the shock absorber spring N3 I 15 and finally the control crank N3 GI 105 with its screw 122302.

Holding the housing steady, push the crank N3 GI 105 so as to make it hook onto the housing (figure 78).

Place the unit so formed in position on the escapement shaft. Hook a head of the spring N3 T 42 to the crank N3 GI 105 (figure 78).

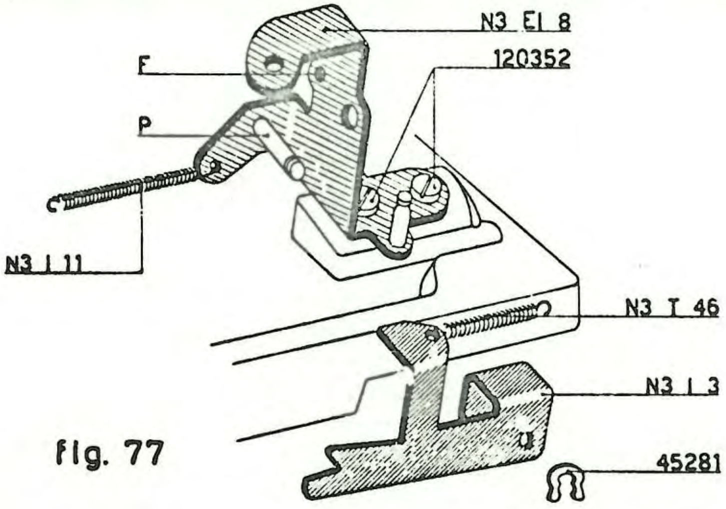

N3 EI 8
120352
F
P
N3 I 11
N3 T 46
N3 I 3
45281

fig. 77

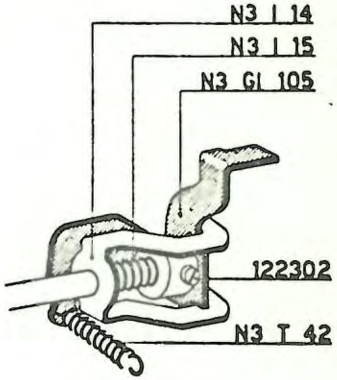

N3 I 14
N3 I 15
N3 GI 105
122302
N3 T 42

fig. 78

*l*) Introduce the right end of the shaft in the hole of the right bracket N3 EI 8 (figure 79). Place the corresponding bracket N3 I 7 in position on the left end of the shaft; secure the bracket to the base with two screws 120352.

Check that the shaft is perfectly free to rotate.

Place the collar 142401 on the left end of the escapement shaft with its screw 120302, and at the other end mount the shock absorber unit prepared according to paragraph *h*).

The escapement shaft should project for the same distance as both the collar 142401 and the shock absorber unit and should have an axial play of 0.2 mm. When this condition is reached, clamp both the collar and the shock absorber unit to the shaft.

Hook spring N3 T 42 to the pin of the right bracket.

Hook spring N3 I 11 between the movable tooth N3 I 2 and the right bracket N3 EI 8 (see figure 77 also).

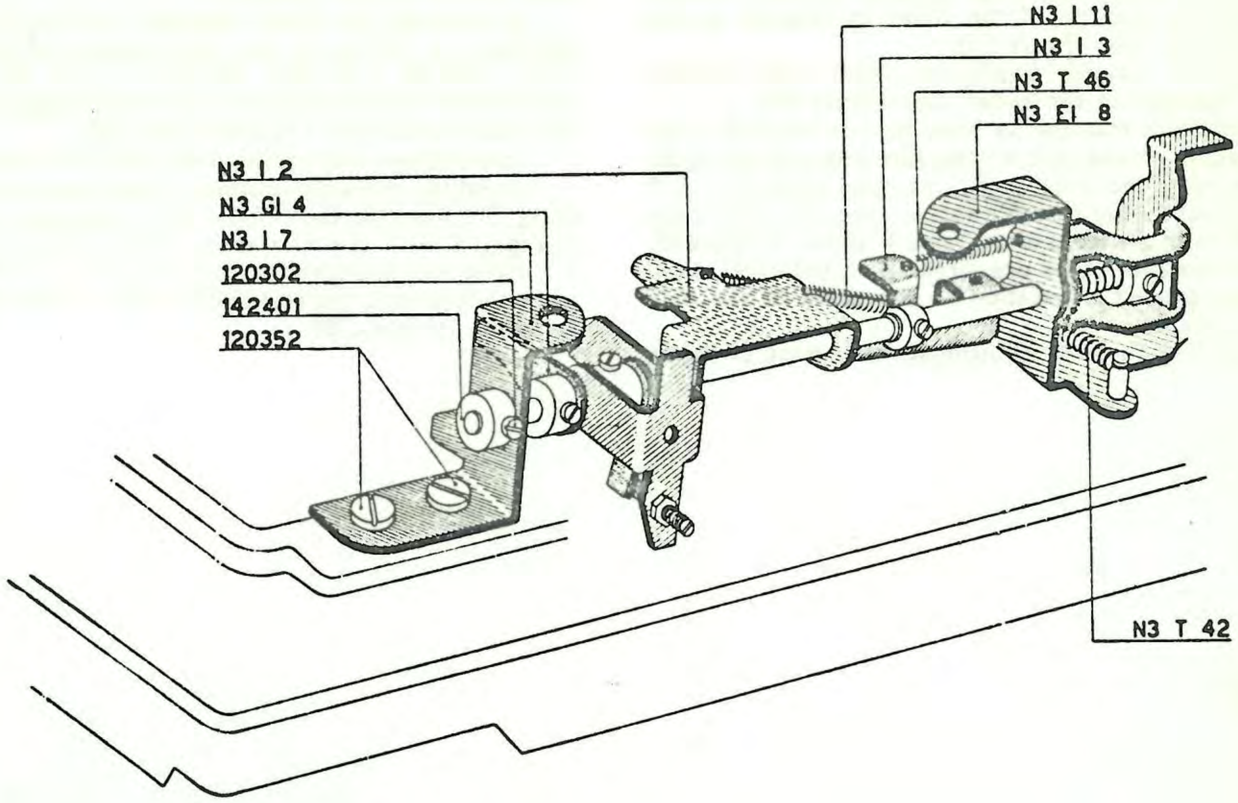

N3 I 11
N3 I 3
N3 T 46
N3 EI 8
N3 I 2
N3 GI 4
N3 I 7
120302
142401
120352
N3 T 42

fig. 79

*l*) Screw the spring holder 136351 on to the base. Hook the spring N3 C 17 of the slide to it (figure 80).

*m*) Now adjust the axial position of the movable tooth and the position of the slider in relation to the stops **A** of the racks (figure 81).

Bring the movable tooth into mesh with the last tooth **D** but one of the slider rack (figure 80).

Operate the machine by hand so that the « **A** stops of the racks » go and rest on the zero stops of the slide.

By moving the slide shaft, the stop plate N3 GI 9 and consequently the movable tooth makes the slide stops come level with the stops of the racks as shown in figure 81.

Since the slide stops are larger than the rack teeth, the former project in relation to the teeth of the rack for a distance **L**.

In carrying out this adjustment, care must be taken to make the rack return to below zero every time that the rockerslide group has to be moved. Bring the machine back to the normal position.

*n*) Keeping the shock absorber unit in the normal position, i.e. resting on the right bracket of the escapement, turn the stop plate N3 GI 9 so that the required clearance of 1 mm (temporary adjustment) is found between the fixed tooth N3 I 1 and the slide rack.

Screw down the screw of the N3 GI 9 thoroughly.

*o*) Adjust the axial position of the eccentric bushing. Bring the movable tooth N3 I 2 to a position so that it is engaged with the first tooth of the slide rack.

Move the eccentric bushing N3 I 16 on the escapement shaft so that the clearance of 10.2 ÷ 10.4 is obtained as shown in figure 83.

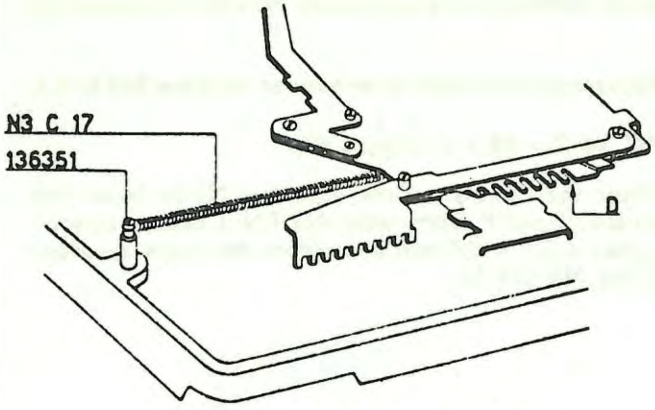


fig. 80

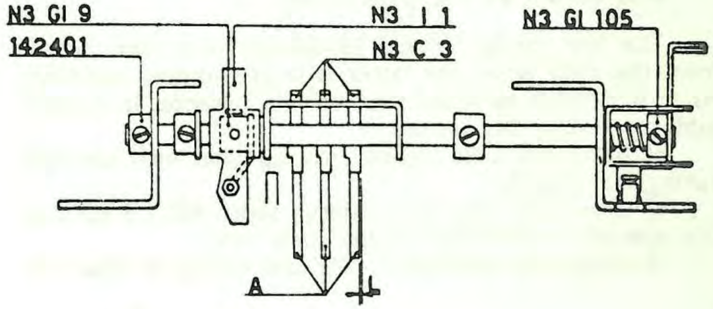


fig. 81

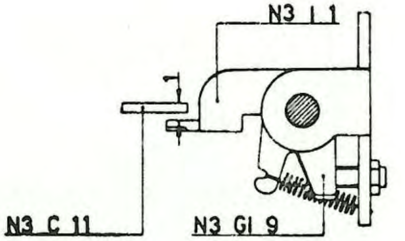


fig. 82

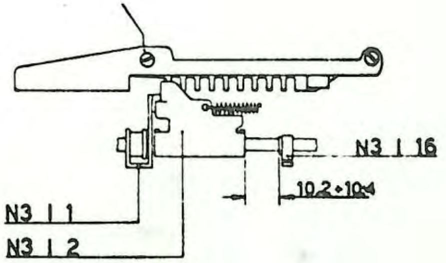


fig. 83

## 70 - Adjusting the position of the shock absorber leaf spring N3 EN 13.

### MC 14 D - M - E (Figure 84)

The leaf spring N3 EN 13 should be 5 mm distant from the slide when the latter is in the normal position. As it is difficult to make sure of this distance, it is advisable to follow this system:

*a*) bring the slide lightly into contact with the leaf spring N3 EN 13;

*b*) lower the stop of one pitch tooth N3 I 3 so that the movable tooth rests on the slide rack;

c) adjust the position of the leaf spring so that the clearance between the movable tooth and the washers which are against the fixed tooth is 5 mm.

Screw down the clamp screws N3 EN 13 thoroughly.

## 71 - Adjusting the slide return lever release N3 EN 3.

### MC 14 D - M - E (Figure 85)

Adjust the position of the eccentric N3 N 24 so that the release of pin P from lever N3 EN 3 occurs as soon as the slide is 0.1 ÷ 0.5 mm away from the shock absorber leaf spring N3 EN 13.

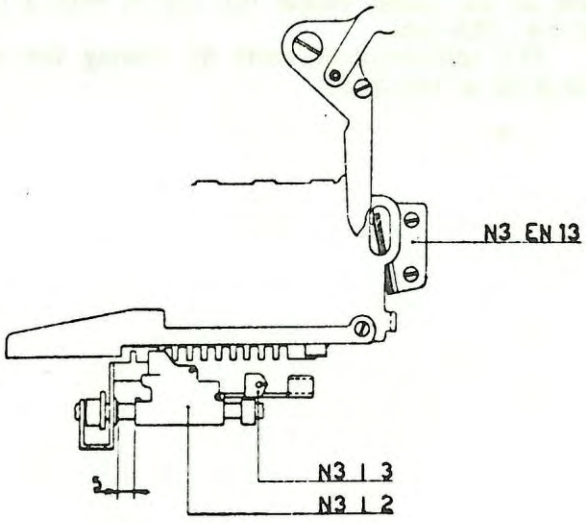


fig. 84

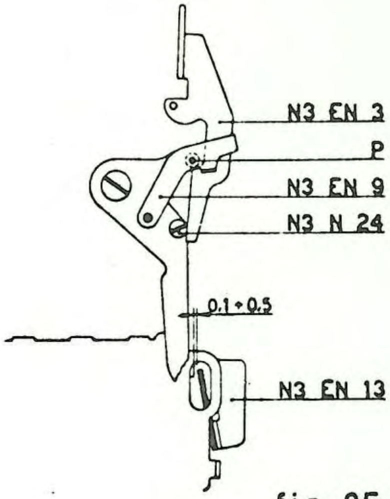


fig. 85

## 72 - Adjusting plate N3 EN 1.

### MC 14 D - M  E (Figure 86)

Keep the machine in normal position. Adjust the angular position of the plate N3 EN 1 in relation to the crank of the main shaft N3 GR 1 so that there is a clearance of 0.9 ÷ 1 mm between the pin **P** (mounted on lever N3 EN 3) and the rocker of the repeat N3 GN 15.

When the required position is obtained, screw down the screw 121401 and its nut 138405.

## 73 - Adjusting the repeat.

### MC 14 D - M - E (Figure 87)

Enter a single number on the slide.

Start the machine going and check that the pin **P** (mounted on the lever N3 EN 3) passes over the lower arm of the repeat rocker N3 GN 15 with a clearance of 0.4 ÷ 0.5 mm.

The adjustment is made by moving the eccentric N3 B 32 as required.

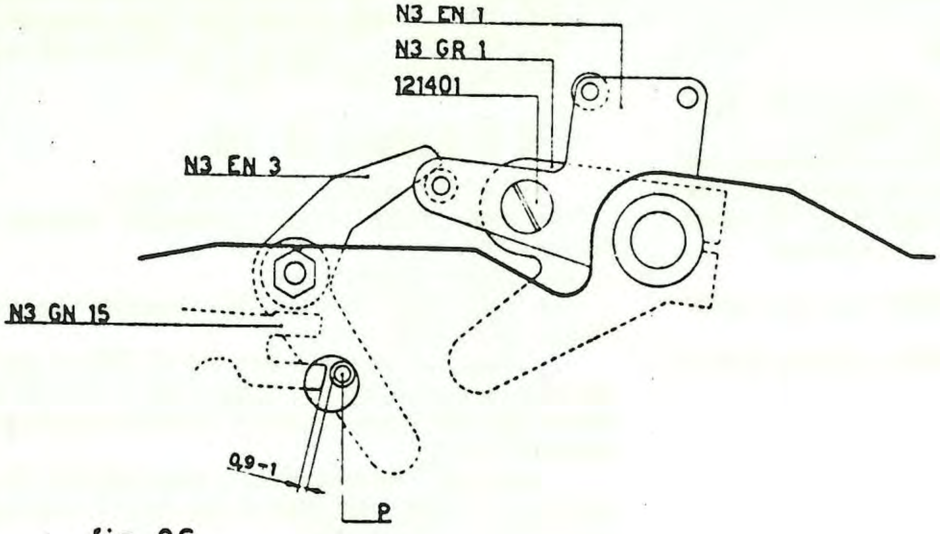


fig. 86

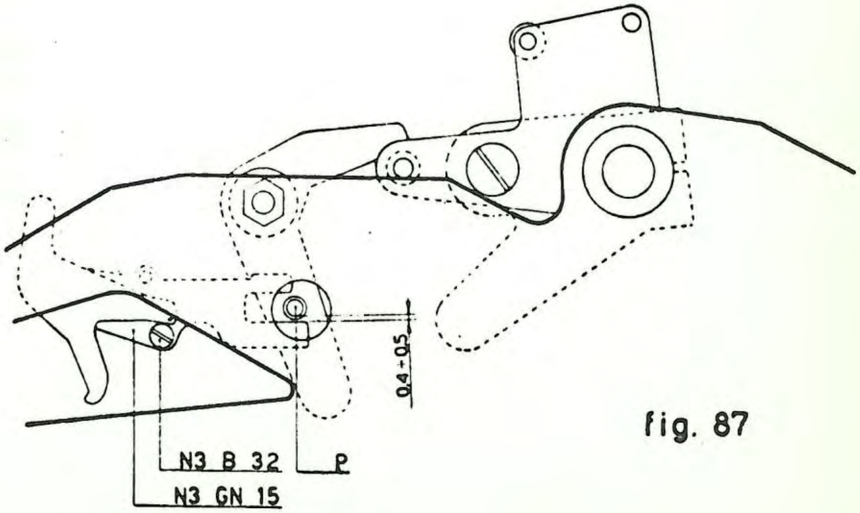


fig. 87

## 74 - Assembling the column indicator.

**MC 14 D - M - E** (Figure 88)

Place the column N3 G 32 in position on the right outer side of the machine with a nut 138601.

Lodge the slot of the right bend of the indicator on the column N3 G 32. The left bend has two holes; the lower one is lodged on the part of shaft N3 H 29 which projects from the left outer side of the machine.

Clamp the column indicator:
— on the right side with a nut 138601 and the screw 120302;
— on the left side with the screw 120302, placing washer 403611 underneath.

## 75 - Assembling the prolonged division bridge N3 GQ 109 - Exact remainder stop control bridge N3 GQ 56 - Printing link N3 G 130 and line spacing pull rod N3 GU 13.

**MC 14 D** (Figures 88 - 88a)

*a)* On the column N3 G 32 lodge:
— the right bend of the prolonged division bridge N3 GQ 109;
— the washer 40621;
— the right bend of the exact remainder control stop bridge N3 GQ 56.

*b)* Place the printing link N3 G 130 in position in the proper groove on the column N3 G 32. In the rear hole of the link lodge the pin P of the line spacing control lever N3 EU 29.

Lodge the line spacing pull lever N3 GU 13 on the same pin, making sure that at the rear it is in the position shown in figure 88.

Secure the pull lever and the link with the flexible clip 45221.

c) Hook spring N3 U 34 between the N3 GU 13 and the print control double hook N3 T 31 (figure 88a).

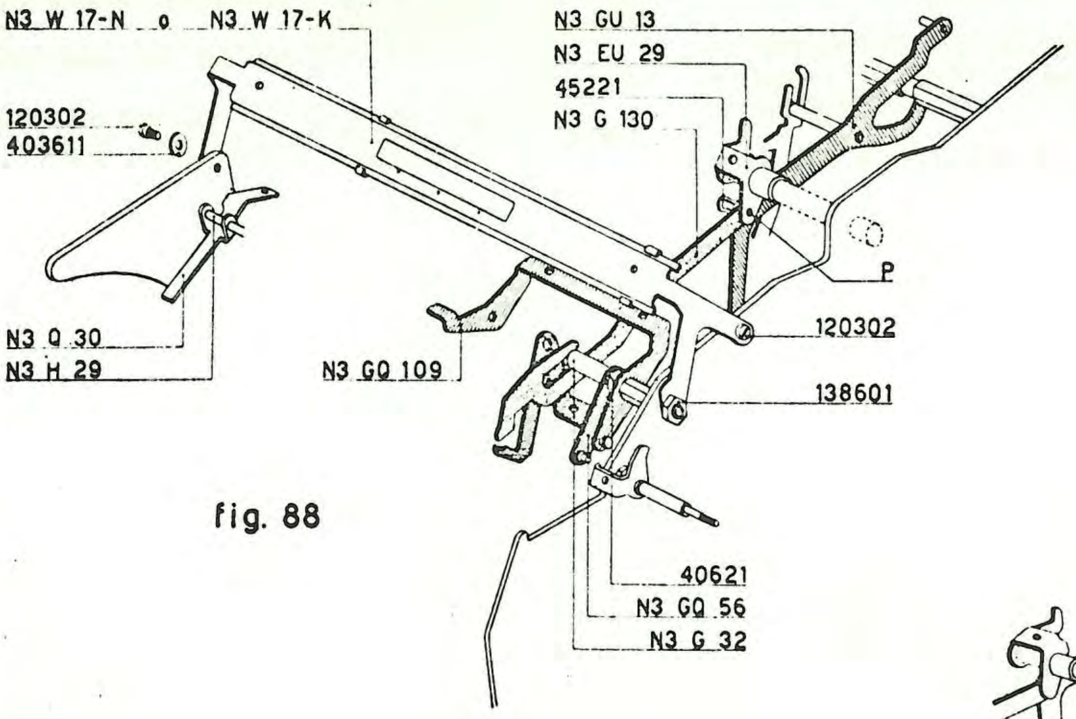


fig. 88

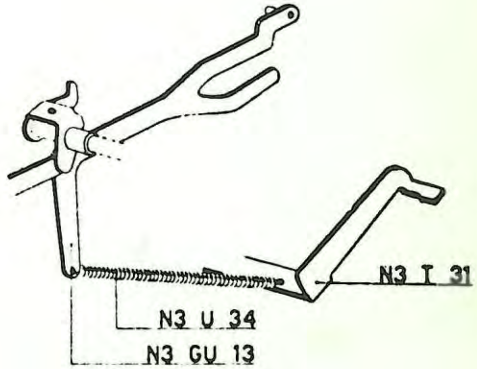


fig. 88a

**MC 14 M - E (Figures 89 - 89a)**

*a*) Place the printing link N3 G 130 in position in the proper groove of the column N3 G 32. Lodge the pin P of the line spacing control lever N3 EU 29 in the rear hole of the link.

Lodge the line spacing pull lever N3 GU 13 on the same pin, taking care that, at the rear, it is in the position shown in figure 89.

Secure the pull lever and the link with a flexible clip 45221.

*b*) Hook the spring N3 U 34 between the N3 GU 13 and the print control double hook N3 T 31 (figure 89a).

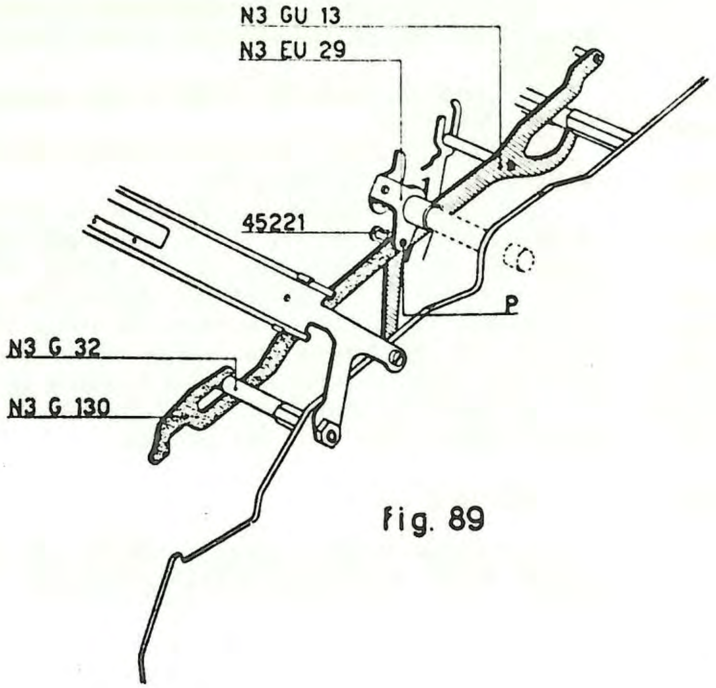


fig. 89

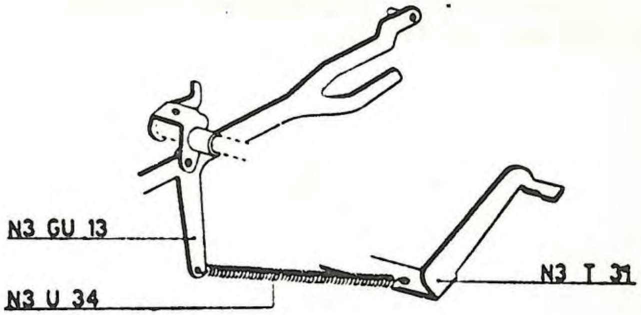


fig. 89a

## 76 - Assembling the non print release bridge N3 M 268.

### MC 14 D (Figures 90 - 90a)

*a*) Place the hub of the multiplication printing control arm N3 EM 265 on the shaft N3 Q 2 with its screw 1253022.

*b*) Lodge the shaft N3 Q 2 in the opening of the column N3 G 32.

c) Place the non print release bridge N3 M 268 in position as shown in figure 90a.

*d*) Lodge the flexible clip 45221 in the special notch of the shaft N3 Q 2; the clip should impact against the inner face of the right bend of the bridge N3 M 268. Bring the hub of the N3 EM 265 against the nut **D** of the column N3 G 32; screw down the screw 1253022 of the N3 EM 265 leaving the bridge N3 M 268 a slight axial play which ensures it perfect freedom to rotate.

e) Hook spring N3 T 46 between the bridge N3 M 268 and the hook N3 EM 265.

### MC 14 M (Figures 91 - 91a)

*a*) Place the hub of the multiplication printing control arm N3 EM 265 on the shaft N3 M 267 with its screw 1253022.

*b*) Lodge the shaft N3 M 267 in the opening of the column N3 G 32.

c) Place the non print release bridge N3 M 268 in position as shown in figure 91a.

*d*) Lodge the flexible clip 45221 in the special notch of the shaft N3 M 267; the clip should impact against the inner face of the right bend of the bridge N3 M 268. Bring the hub of the N3 EM 265 against the nut **D** of the column N3 G 32; screw down the screw 1253022 of the N3 EM 265 leaving the bridge N3 M 268 a slight axial play which ensures it perfect freedom to rotate.

e) Hook the spring N3 T 46 between the bridge N3 M 268 and the hook N3 EM 265.

### MC 14 E

The pieces listed in paragraph 76 for MC 14 D and MC 14 M are not used on the Elettrosumma.

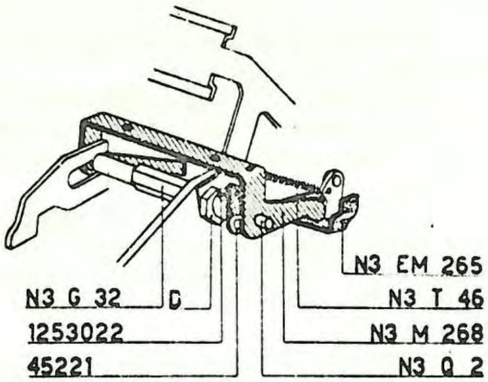


fig. 90

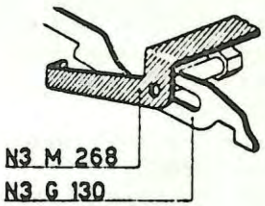


fig. 90a

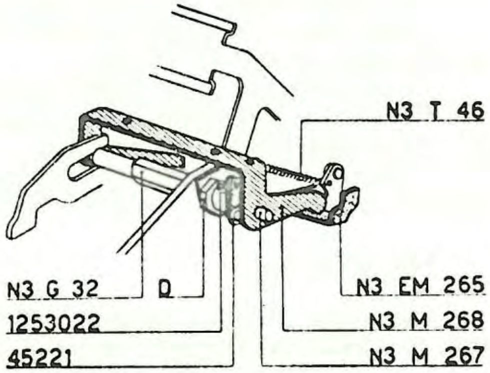


fig. 91

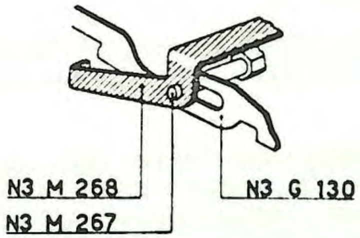


fig. 91a

## 77 - Assembling pull rod for slide advance N3 GQ 20.

### MC 14 D (Figure 92)

*a*) Mount the adjustable plate N3 Q 42 on the slide return tooth N3 EQ 17 with a screw 120302 which should only be partially screwed down.

Hook the spring N3 G 51 between the N3 EQ 17 and the N2 Q 42.

*b*) Attach the small column N3 Q 41 to the base with the nut 138405.

*c*) Lodge the bend of the adjustable arm N3 Q 42 in the front slot of the slide advance pull lever N3 GQ 20.

Place the unit thus formed in position as shown in the figure. Ensure that the N3 GQ 20 is lodged in the slit in the plate N3 Q 19. The unit N3 EQ 17 - N3 Q 42 is then placed in position on the pin N3 Q 41 and secured with a flexible clip 45281.

Hook the spring N3 I 11 between the pull rod N3 GQ 20 and the support square N3 EG 18 D.

### MC 14 M - E

The pieces listed in paragraph 77 for MC 14 D are not used on the Multisumma nor the Elettrosumma.

## 78 - Assembling the feeler cam control arm N3 GQ 35 - The feeler cam N3 GQ 14 - The non print and subtraction control crank N3 GQ 13 and the indicator bridge. N3 EQ 33.

### MC 14 D (Figures 92 - 92a - 92b)

*a*) Lodge a washer 40506 on the shaft of the feeler cam control arm N3 GQ 35.

*b*) Place the indicator bridge N3 EQ 33 in position as shown in the figure.

*c*) Introduce the shaft of the N3 GQ 35 into the hole in the left bend of the indicator bridge N3 EQ 33 and then in the special guide hole in the left side of the machine.

*d*) On the shaft N3 GQ 35 lodge in order:

— a collar 142461 with its screw 120262;
— the feeler cam N3 GQ 14 with its two screws 1253022;
— the left bend of the prolonged division bridge N3 GQ 109;
— the right bend of the indicator bridge N3 EQ 33 which should reach the position shown in figure 92b;
— the sub traction and non print control crank N3 GQ 13 with its screws 1253022. The crank should be in the position also shown in figure 92a;
— the left bend of the exact remainder stop control bridge N3 GQ 56;
— the left bend of the non print release bridge N3 M 268.

Finally insert the shaft of the N3 GQ 35 in the hole of the small column N3 G 32.

By adjusting the collar 142461 bring the axial play to the minimum indispensable to obtain the perfect freedom for the bridge NE EQ 33 to rotate.

*e*) Hook the spring N3 Q 75 between the N3 GQ 35 and the spring carrying pin of the N3 EQ 31.

### MC 14 M - E

The pieces listed in paragraph 78 for the MC 14 D are not used on the Multisumma nor on the Elettrosumma.

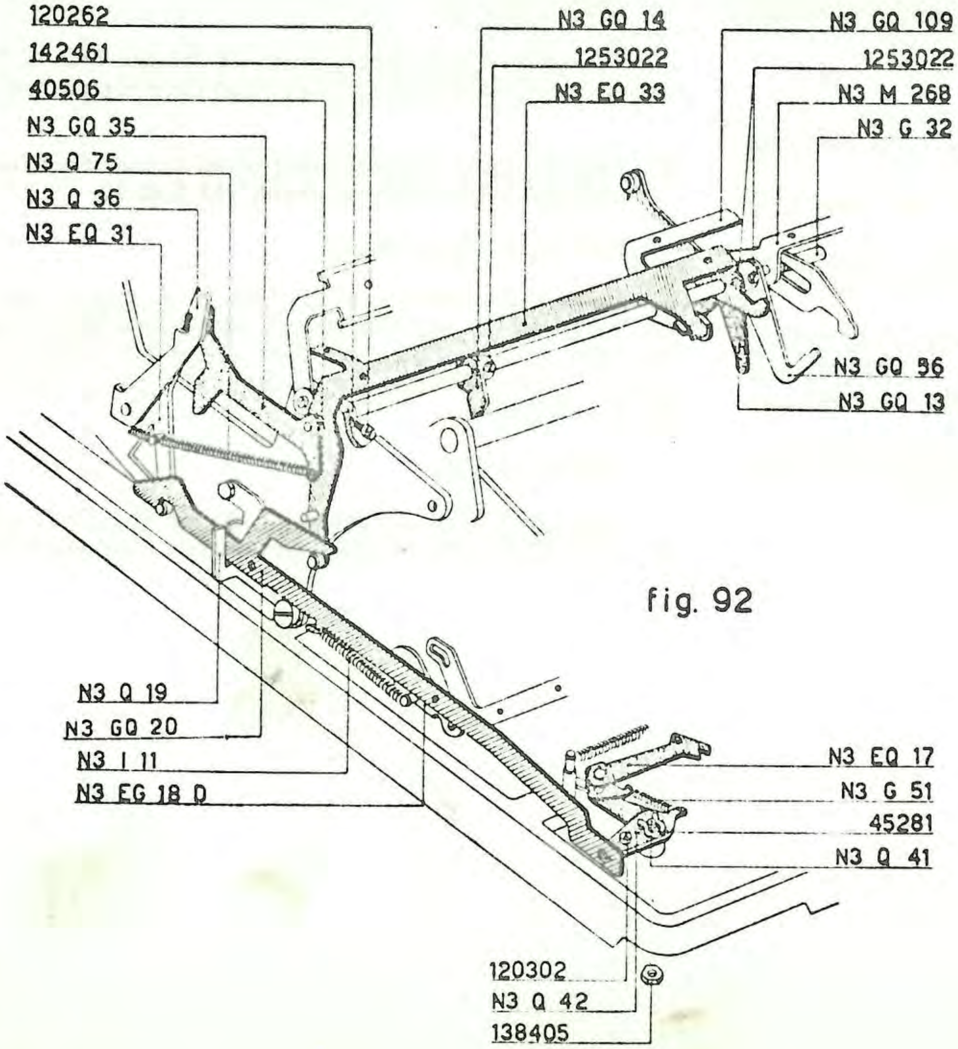


fig. 92

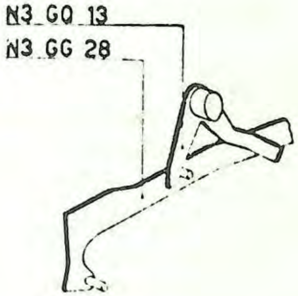


fig. 92a

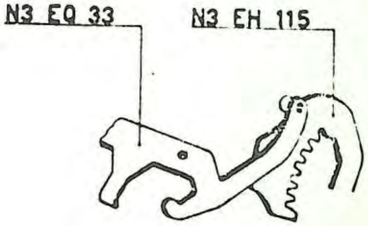


fig. 92b

## *79 - Adjusting the feeler cam control arm N3 GQ 36 and the feeler cam N3 GQ 14.

### MC 14 D (Figures 93 - 94 - 95)

*a*) Hook the arm N3 GQ 35 to the hook N3 Q 36 (figure 93).

*b*) Using a spring setting tool, raise the lever **L** of the negative balance unit (figure 93).

*c*) Bring the feeler cam N3 GQ 14 into contact with the lever **L** at a distance of 1.3 mm from the first of the N3 D 6 on the left (figures 93 and 94).

Partially screw in a screw 1253022 of the N3 GQ 14.

*d*) Unhook the N3 Q 36 from the N3 GQ 35 and rotate the latter slowly upwards through a path of 4 mm (figure 95).

When the required condition is reached, clamp feeler cam N3 GQ 14 with the two screws 1253022.

### MC 14 M - E

The pieces listed in paragraph **79** for the MC 14 D are not used on the Multisumma nor on the Elettrosumma.

## 80 - Adjusting the angular position of the subtraction and non print control crank N3 GQ 13.

### MC 14 D (Figure 96)

Holding the feeler cam N3 GQ 14 in contact with the lever **L** of the negative balance unit (figure 93) secure the crank N3 GQ 13 on the shaft of the N3 GQ 35 so that it is 0.1 ÷ 0.2 mm distant from the pin **P** of the link N3 GG 28.

### MC 14 M - E

The pieces listed in paragraph **80** for MC 14 D are not used on the Multisumma nor on the Elettrosumma.

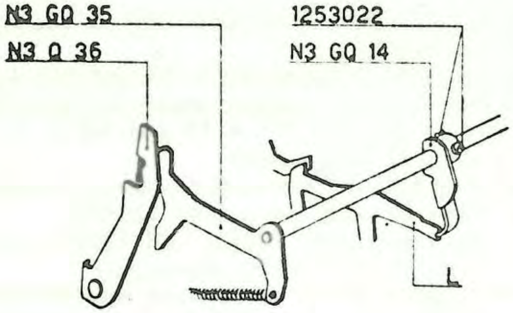


fig. 93

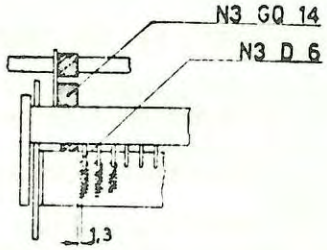


fig. 94

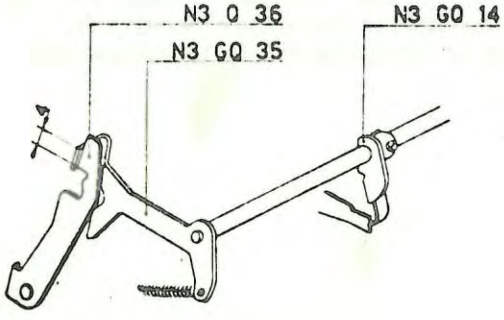


fig. 95

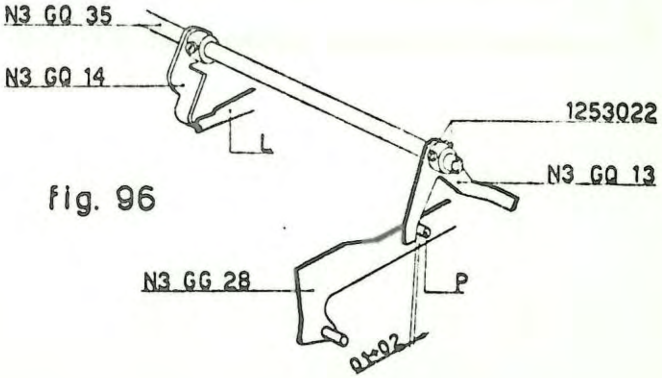


fig. 96

## 81 - Assembling the keyboard unit.

### MC 14 D (Figures 97 - 98 - 99 - 100)

*a*) Check that the clamp screws of the rear brackets of the keyboard N3 A 13 and N3 A 14 (the latter is not visible in figure 97) are loosened.

*b*) Release the spring of the slide and bring the latter to the extreme right.

*c*) Place the Divisumma keyboard unit in position on the four brackets, the two rear ones already mentioned and the two front ones N3 I 7 and N3 EI 8.

Take care that:

— the hook **H** of the universal bar N3 EB 28 is engaged by the crank N3 GI 4 (figure 98);

— the bend of the lever N3 GQ 12 is lodged in the fork of the rocker N3 GQ 70 (figure 99).

Secure the keyboard unit to the left front bracket N3 I 7 with a screw 120302 and to the right front bracket N3 EI 8 with a screw 120303.

Neither of the screws should be screwed all the way in.

*d*) Introduce the controls bracket shaft N3 G 14 (figure 97) so that it rests on the upper edge of the right inner side of the machine.

Move the two rear brackets N3 A 13 and N3 A 14 upwards until they reach the position shown in figure 100.

Clamp the two brackets N3 A 13 and N3 A 14 to the respective sides of the machine.

e) The printing unit is fixed to the two rear brackets N3 A 13 and N3 A 14 with two screws 120302.

Screw in the two screws 120302 and 120303 which hold the unit to the front brackets thoroughly.

*f*) Hook the spring N3 D 16 between the N3 GQ 8 and the spring holder for the setter **P** of the keyboard (figure 99).

### MC 14 M - E

See paragraph 81 for the MC 14 D. — The keyboard, which is not the same as that of the divisumma (see « assembly and adjustment of units ») is fixed to the four brackets, N3 I 7, N3 EI 8, N3 A 13 and N3 A 14 with as many screws 120302. None of the operations given in c) should be carried out; the bend of lever N3 GQ 12 is lodged in the fork of the rocker N3 GQ 70.

Neither is the spring N3 D 16 hooked on.

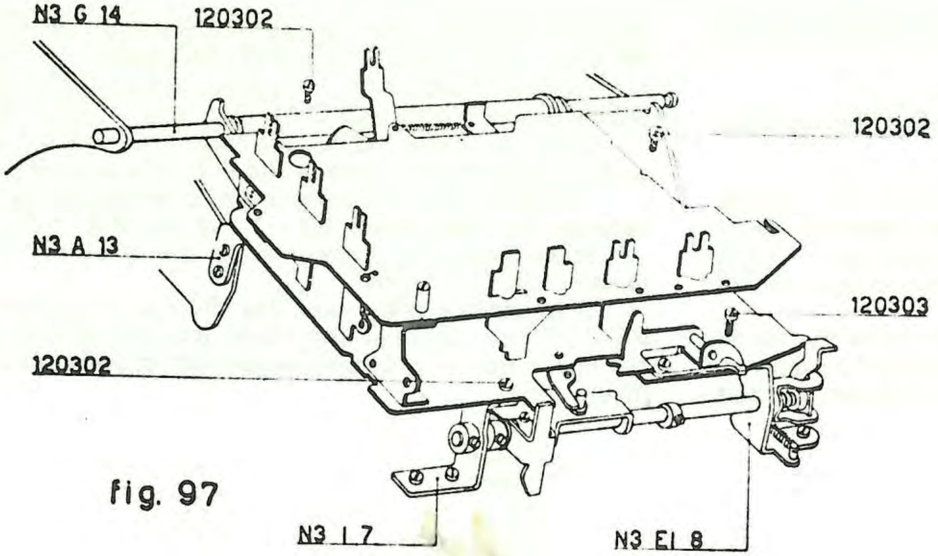


fig. 97

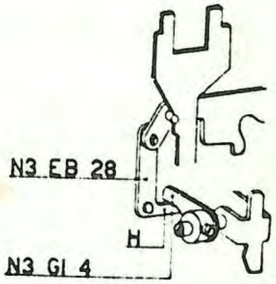


fig. 98

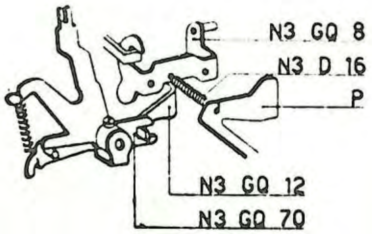


fig. 99

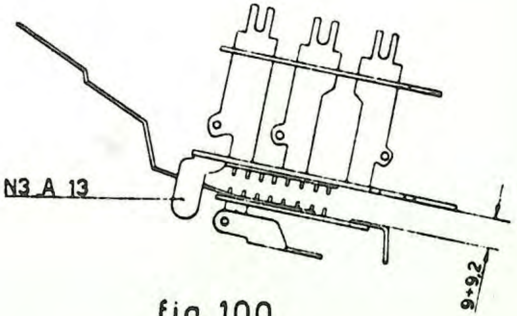


fig. 100

## 82 - Adjusting the angular and axial position of the crank N3 GI 4.

**MC 14 D - M - E** (Figures 101 - 102 - 102a - 102b - 103)

*a*) The axial position of the crank N3 GI 4 should be such that it is in the centre of the lower lug **H** of the universal bar N3 EB 28 (i.e. 2.8 mm from its right end - figure 101). The crew of the scrank N3 GI 4 should not be screwed all the way in.

*b*) Bring the crank N3 GI 4 in contact with the lug **H** of the universal bar, using a screw driver as indicated in figure 102; make sure that the pin **P** of the bar remains almost in contact with the inclined plane of the 0, 00, 000 keys. Turn the crank N3 GI 105 towards the front until the fixed tooth N3 I 1 pushes the movable tooth out of the slide rack N3 C 11 (first trip - figure 102a).

Bring the crank N3 GI 105 back until the movable tooth engages with a tooth of the slide rack (second trip).

Check that there is a maximum clearance of 0.2 mm between the fixed tooth N3 I 1 and the slide rack.

Screw down the screw holding the crank N3 GI 4 to the shaft thoroughly.

*c*) In addition make sure that there is a clearance of 0.5 ÷ 0.7 mm between the crank stop N3 GI 105 and the upper side of the right escapement bracket N3 EI 8 (figure 103).

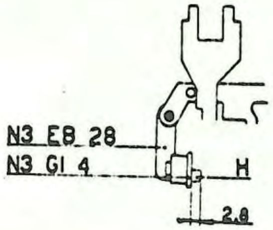


fig. 101

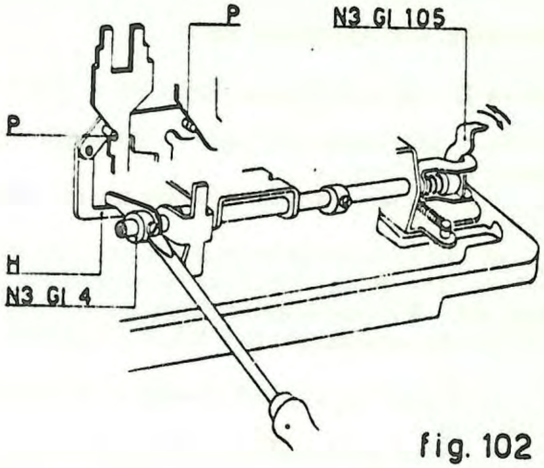


fig. 102

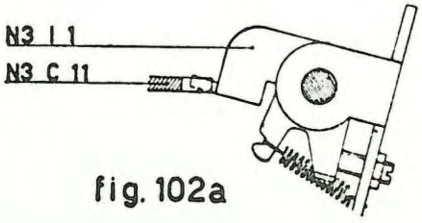


fig. 102a

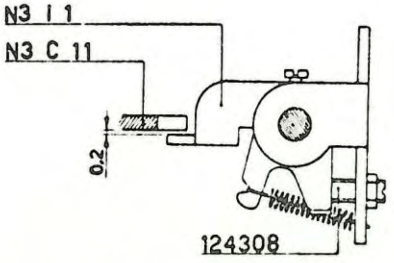


fig. 102 b

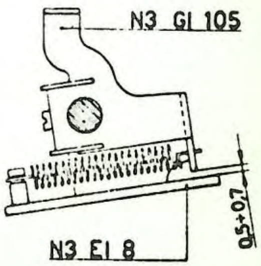


fig. 103

## 83 - Adjusting the keyboard locks.

### MC 14 D - M - E (Figures 104 - 105 - 105a - 105b)

*a*) Figure 104 shows the parts with which this adjustment is concerned.

The first conditions to be obtained are the following (figure 105):

— when all the keys are in normal position, the hooking point of the stop **B** and the hook **A** should be on the same line XX. The condition is reached by bending the right and of the adjustable plate N3 B 35 slightly up or down;

— the stop **B** and the hook **A** should be 0.4 mm away from each other.

The condition is reached by bending the upper part of the hook **A** itself which rests on the upper plate **P** of the keyboard.

*b*) Lower one of the numerical keys of the keyboard slowly for a whole stroke and make sure that after the **A** and **B** have engaged, there is a further stroke of 0.2 mm (figure 105a). The condition is reached by moving the adjustable plate N3 B 35 to right or left.

*c*) Lower a key slowly so as to cause the first hooking between the adjustable plate N3 B 35 and the stop **B** (figure 105b). Check that all the number keys of the keyboard are locked; if they are not, the preceding adjustments were not made correctly.

*d*) Check that the trip, of the number keys takes place in the following order:

— first engaging (figure 105b);
— trip of the movable tooth;
— second engaging (figure 105a);
— extra stroke (figure 105a).

The movable tooth should be tripped at 2/3 of the stroke occurring between the first and second engaging.

If the movable tooth trips ahead of time, the clearance of 0.8 mm (maximum clearance) between the fixed tooth and the movable tooth must be reduced by means of the screw 1253028 (figure 76a).

If, on the other hand, with the 0.8 mm clearance, the trip is late, it is a sign there is a clearance of more than the 0.2 mm required between the fixed tooth and the slide rack (figure 102b). In this case the position can be corrected with the screw 124308, keeping the adjustment to the minimum necessary, otherwise the tension of the spring of the flexible coupling will be changed.

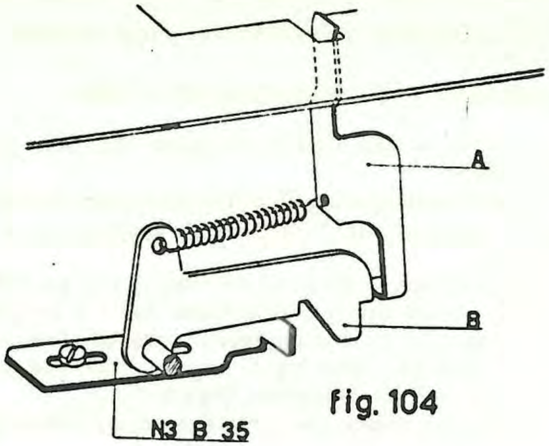


fig. 104

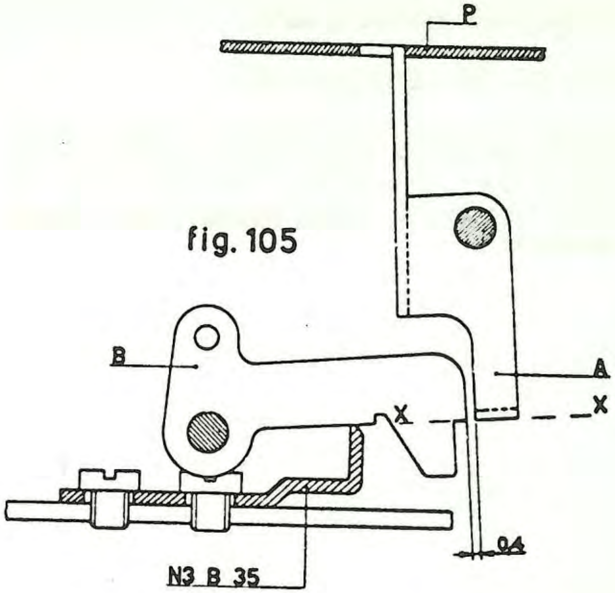


fig. 105

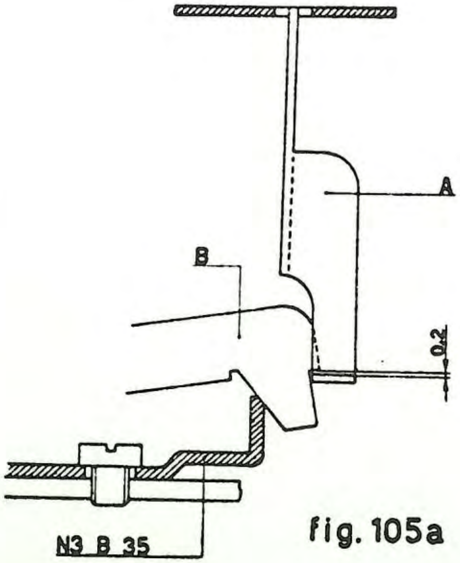


fig. 105a

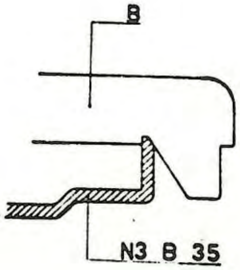


fig. 105b

## 84 - Adjusting the keyboard lock.

### MC 14 D - M - E (Figure 106)

Bring the slide into contact with the shock absorber leaf spring N3 EN 13 and check that the push rod **P** has a clearance of 0.3 ÷ 0.6 mm from the stop of rack **A**. The correct condition is reached adjusting the position of the eccentric **E**.

## 85 - Adjusting the universal bar stop square.

### MC 14 D - M - E (Figures 107 - 107a)

*a*) Lower a key slowly to cause the first engaging (figure 105b).

*b*) Check that the lug **C** of the universal bar N3 EB 28 passes in front of the hook **S** with a clearance of 0.3 ÷ ÷ 0.4 mm.

The condition is obtained by moving the pin N3 H 128 along the slot of the movable tooth N3 I 2 as required.

*c*) With the slide completely entered, lower a key and check that the same lug **C** engages with the square **S** for at least half its thickness (figure 107a).

If necessary check the previous adjustments again.

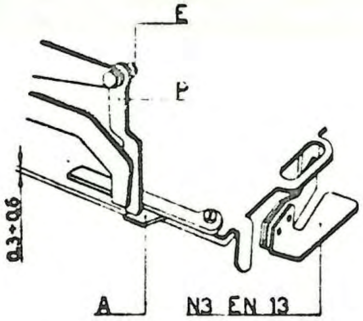


fig. 106

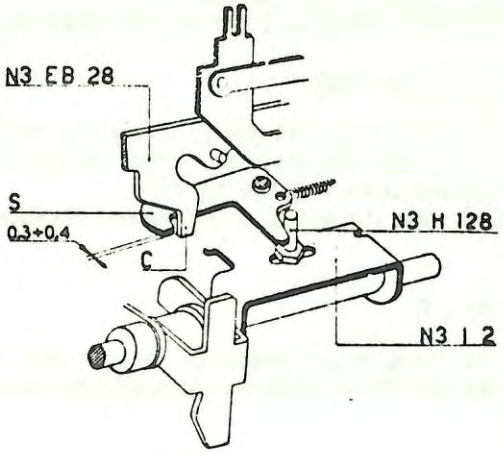


fig. 107

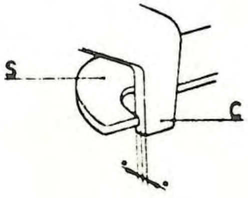


fig. 107a

## 86 - Adjusting the clearance between the pin N3 H 128 on the movable tooth and the rocker N3 GQ 100.

### MC 14 D (Figure 108)

Lower the « 00 » key completely. Bring the movable tooth back to the front for the whole of its extra stroke. Check the distance shown in the figure.

If necessary bend the end **E** of the rocker N3 GQ 100 slightly.

### MC 14 M - E

The pieces listed in paragraph 86 for the MC 14 D are not used on the Multisumma nor on the Elettrosumma.

## 87 - Adjusting the complete entry of the slide.

### MC 14 D (Figure 109)

Lower the « 0 » and « 000 » keys completely. Check that the movable tooth is 0.8 mm higher than the slide rack.

If necessary move the bracket N3 GQ 102 after loosening the screw **V**; actually a slot enables the bracket itself to be moved towards the front or back of the machine.

### MC 14 M - E

The parts listed in paragraph 87 for the MC 14 D are not used on the Multisumma nor on the Elettrosumma.

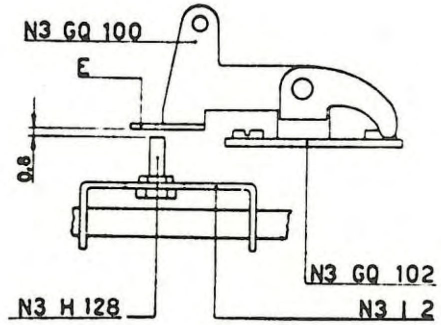


fig.108

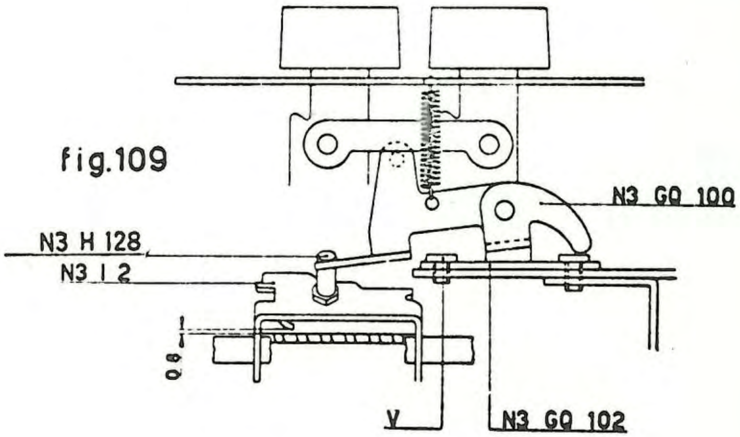


fig.109

## 88 - Assembling the starter slider N3 EG 117 and the non-add control lever N3 EG 6.

### MC 14 D - M - E (Figure 110)

*a*) Place the starter slider N3 EG 117 in position on the left side of the keyboard. Secure it to the starter slider lever N3 GG 16 with a flexible clip 45221.

*b*) Position the non-add control lever N3 EG 6 so that:
— the pin **H** is inserted in the front slot of the non-add control drag link N3 G 107;
— the pin **P** of the transmission bridge N3 EG 12 is in the position shown in the figure.

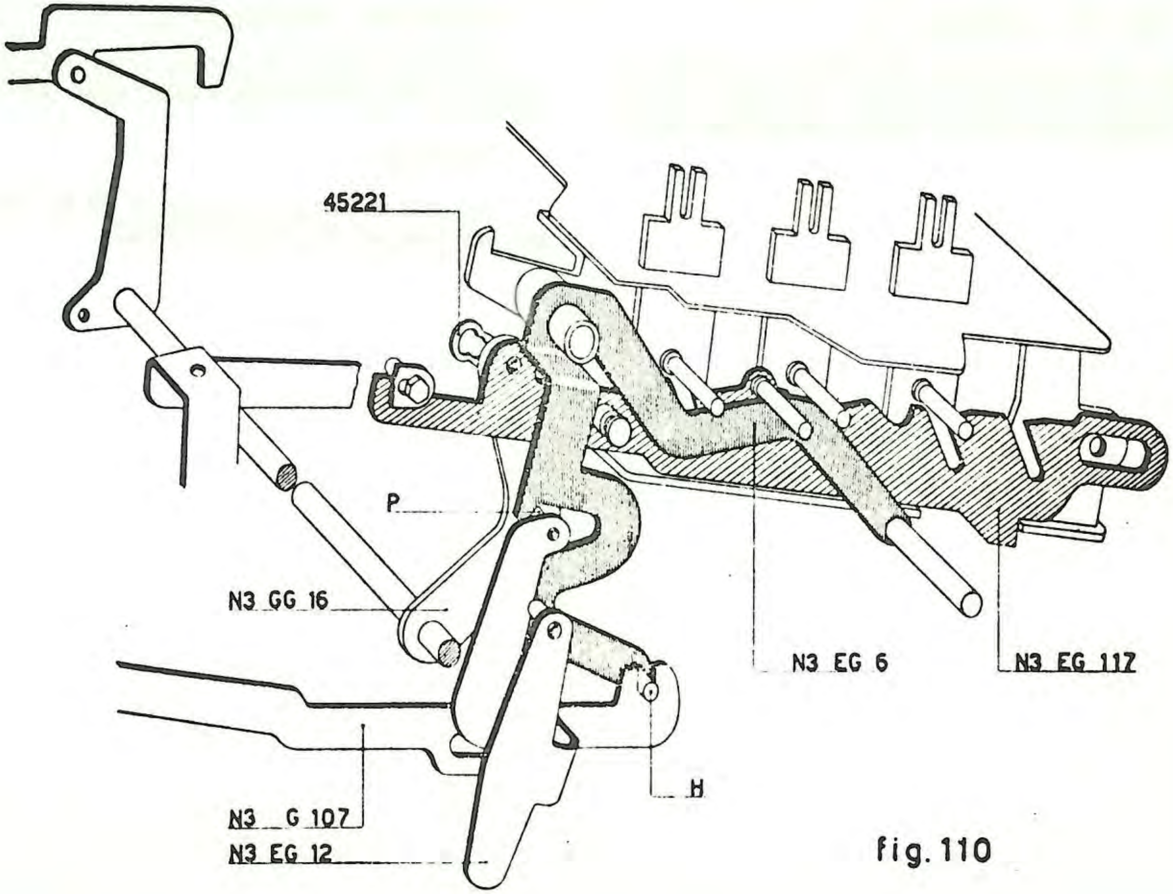


fig. 110

## 89 - Assembling the signs control bar N3 EO 9.

### MC 14 D - M - E (Figure 111)

Place the signs control bar N3 EO 9 in position at the side of the non-add lever N3 EG 6. Attach it to the transmission bridge lever N3 O 7 with a flexible clip 45221.

## 90 - Assembling the plates of the locks N3 G 102.

### MC 14 D - M (Figure 112)

The rear slot of the locks plate N3 G 102 should lodge on the pin **P** of the starter slider N3 EG 117.

### MC 14 E

The pieces listed in paragraph **90** for MC 14 D - M are not used on the Elettrosumma.

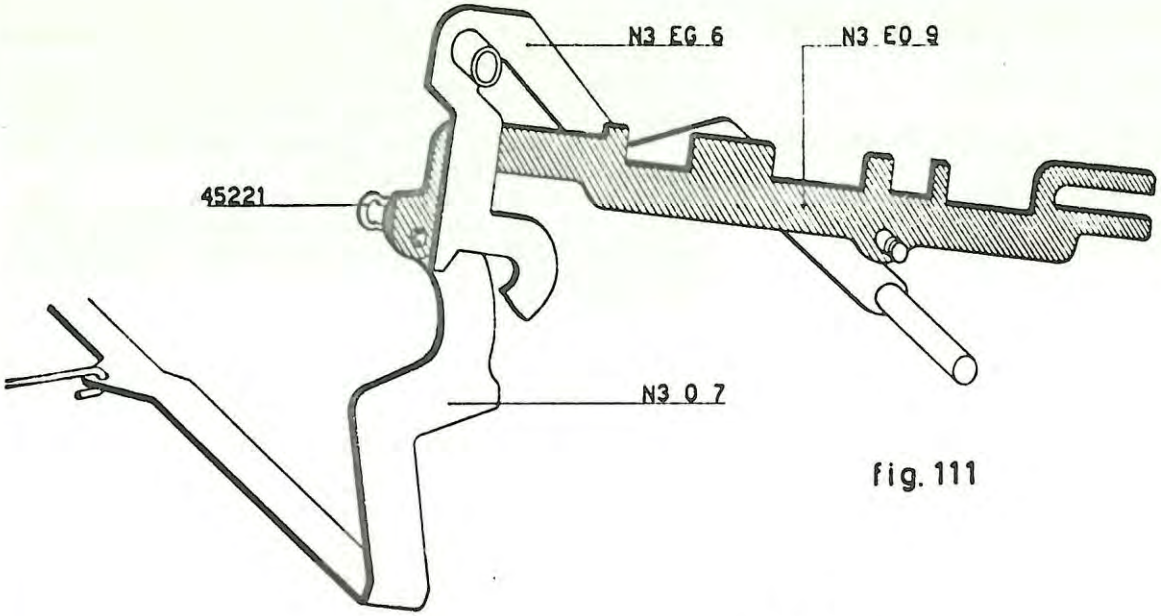


fig. 111

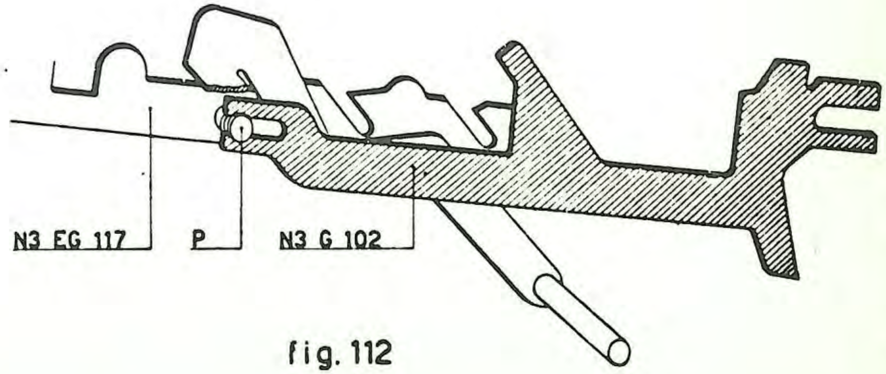


fig. 112

## 91 - Assembling the total control bridge N3 GQ 83.

**MC 14 D** (Figures 113 - 113a - 113b)

*a*) Place the shaft N3 Q 86 in position on the total control bridge N3 GQ 83 (figure 113a).

*b*) Place the shaft N3 Q 86 so that:

— the front part of the signs control bar N3 EO 9 is inserted in its second groove (figure 113);

— the front part of the locks plate N3 G 102 is inserted in the first groove on the right (figure 113);

— the front part of the starter slider N3 EG 117 is placed on the outside of the bridge N3 GQ 83 (figure 113b).

Place a washer 40304 between the slider and the keyboard bracket **S** (figure 113b).

c) Screw the shaft to the bracket **S** (figure 113b) making sure that the right side of bridge N3 GQ 83 is above the pins **A** and **B** of the grand total and subtraction keys (figure 113).

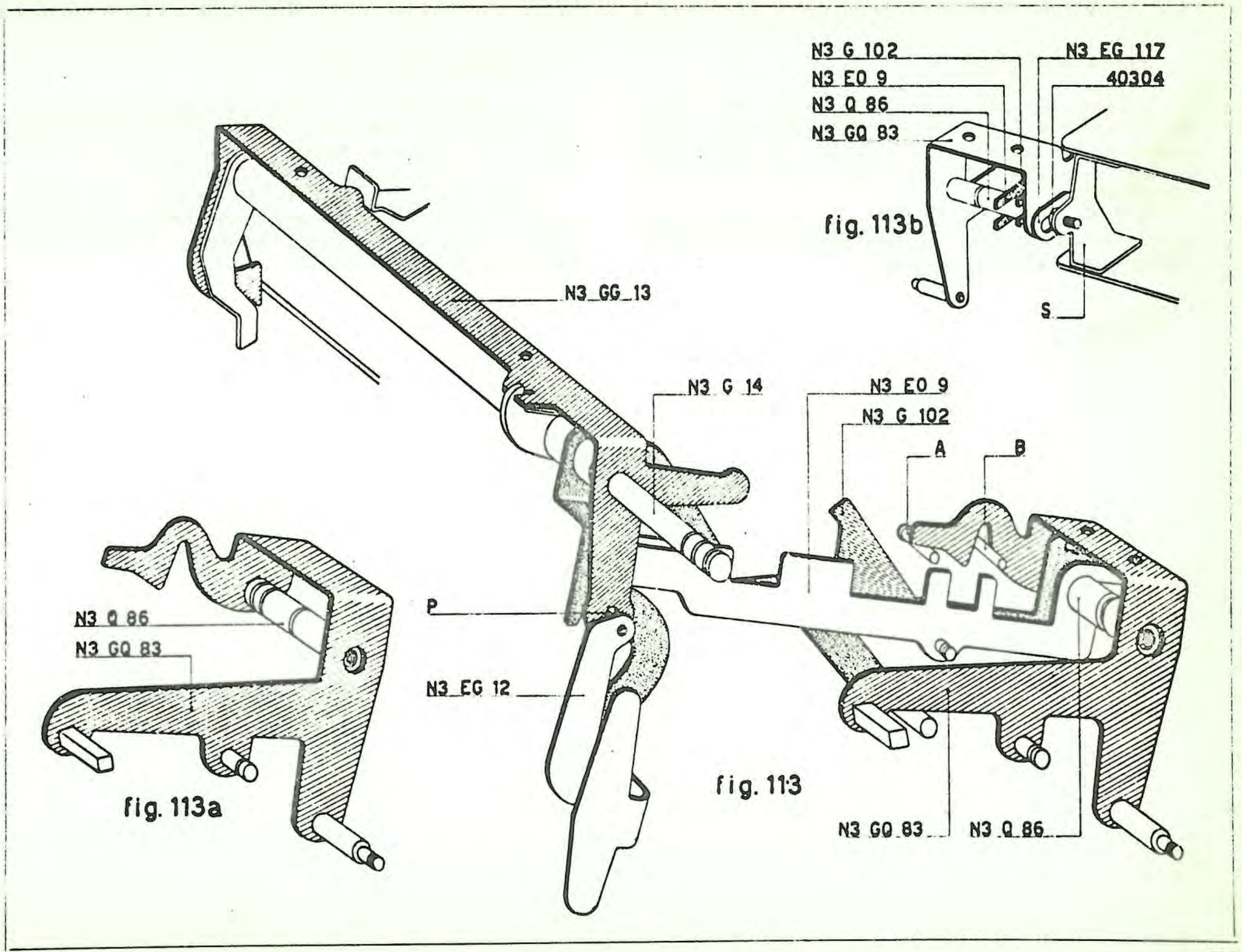


fig. 113b

fig. 113

fig. 113a

### MC 14 M (Figure 114)

*a*) Lodge the front slots of the special signs control bar N3 EO 9 and of the locks plate N3 G 102 in the proper grooves of the bracket pin N3 O 112. On the tapered part of the pin place the front slot of the starter slider N3 EG 117.

*b*) Screw the pin N3 O 112 to the left front bracket which connects the upper and lower plates of the keyboard, placing washer 40304 in between.

### MC 14 E (Figure 115)

*a*) Lodge the front slot of the special signs control bar N3 EO 9 in the proper groove of the bracket pin N3 O 112. On the tapered part of the pin place the front slot of the starter slider N3 EG 117.

*b*) Screw the pin N3 O 112 to the front left bracket which connects the upper and lower plates of the keyboard, placing washer 40304 in between. Secure the pin N3 O 112 with a nut 138305.

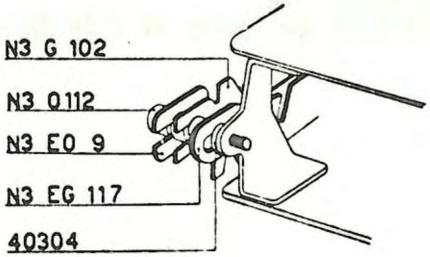


fig. 114

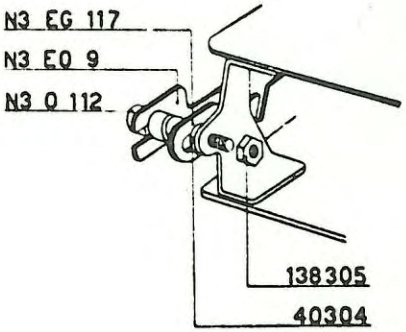


fig. 115

## 92 - Assembling the non print bridge N3 GG 13.

MC 14 D - M - E (Figure 113)

*a*) Place the non-print bridge N3 GG 13 in position so that the fork on its left bend is lodged on the pin **P** of the transmission bridge N3 EG 12.

*b*) Introduce the shaft N3 G 14 from the right of the keyboard.

## 93 - Assembling the complete total lever N3 EG 3.

MC 14 D - M - E (Figures 116 - 116a)

*a*) Lodge the hub of the lever of the totals control N3 EG 3 on the shaft N3 G 14 so that:
— the pin **V** is inserted in the front slot of the motor hook shut off lever N3 G 4 (figure 116);
— the rocker **B** is in the position shown in the figure 116 in relation to the bridge N3 EG 12;
— the pin **P** is on the upper inclined plane of the link N3 EF 5 (figure 116a).

*b*) Hook on the spring M2 E 28 (figure 116).

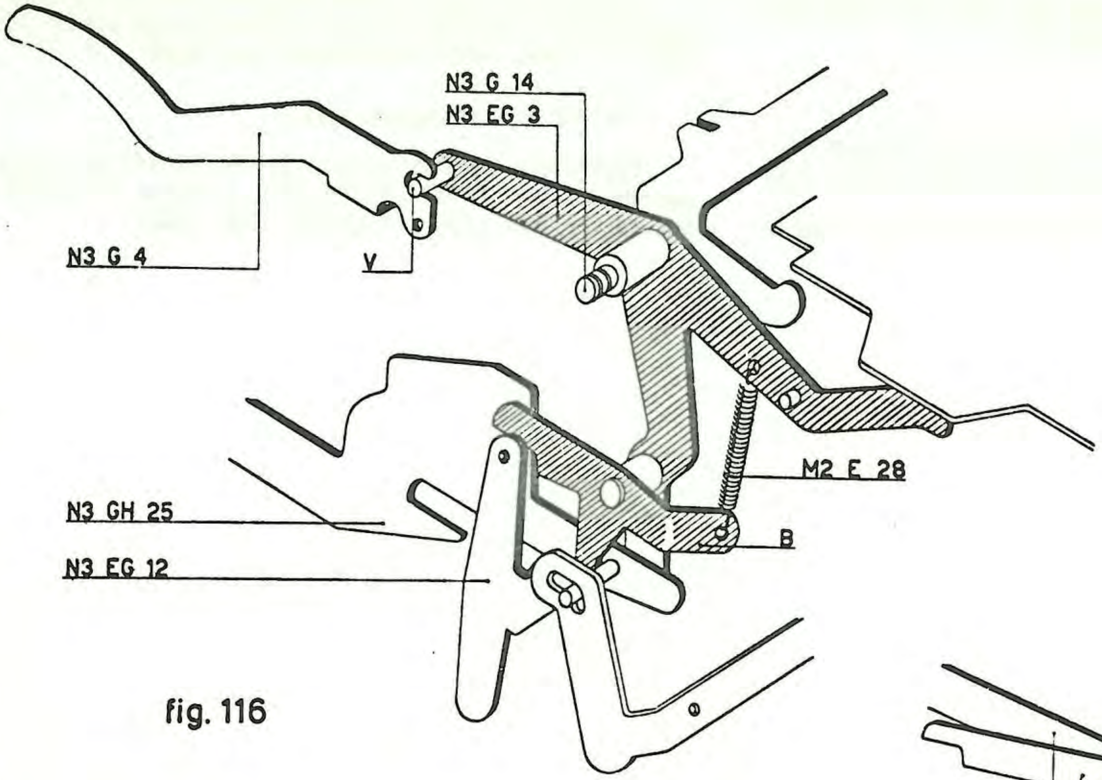


fig. 116

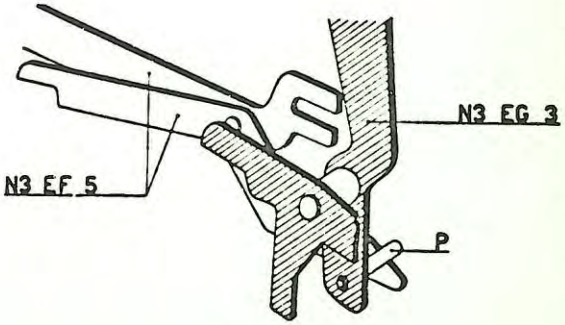


fig. 116a

## 94 - Assembling the lock pull rod N3 Q 11 and the signs control link N3 EO 10.

**MC 14 D** (Figure 117)

*a*) Place the lock pull rod N3 Q 11 in position so that:
— the front part is lodged in the left groove of the shaft N3 Q 86;
— the bend **P** is inserted in front of the front steps of the locks plate N3 G 102.

*b*) Mount the signs control drag link N3 EO 10 which couples the bar N3 EO 9 to the control anchor N3 EH 34. Secure the link with two flexible clips 45221.

**MC 14 M - E** (Figure 118)

Mount the signs control drag link N3 EO 10 which couples the bar N3 EO 9 to the control anchor N3 EH 34. Secure the link with two flexible clips 45221.

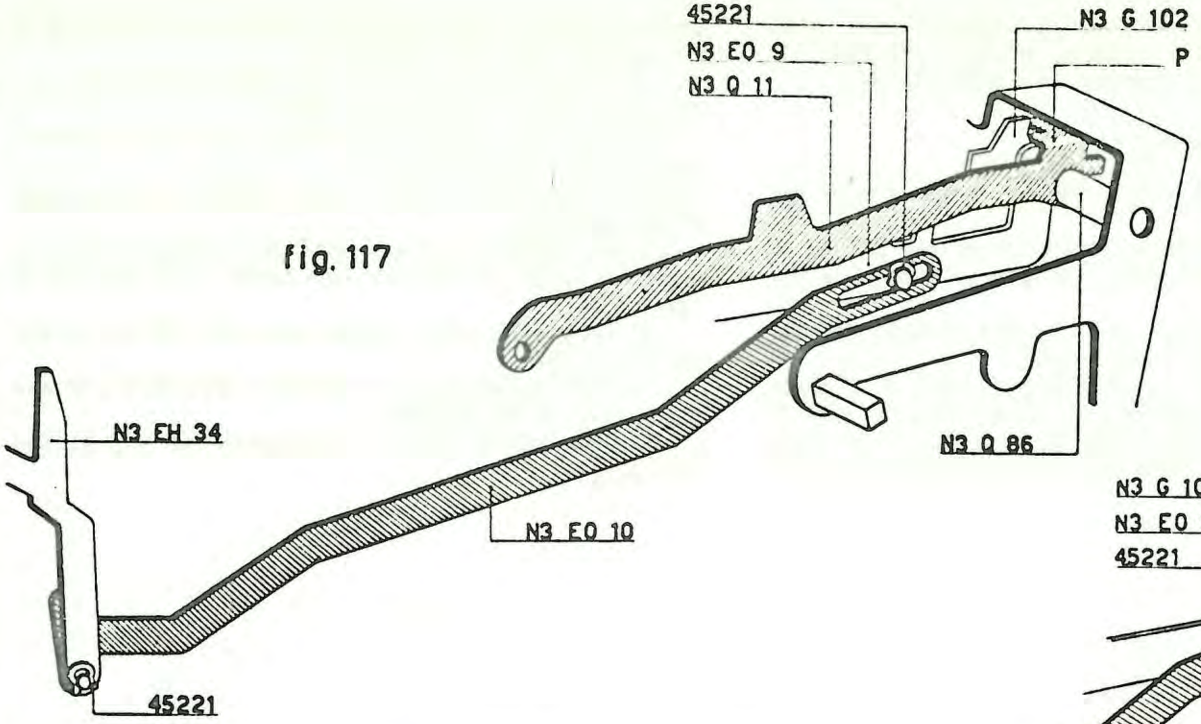


fig. 117

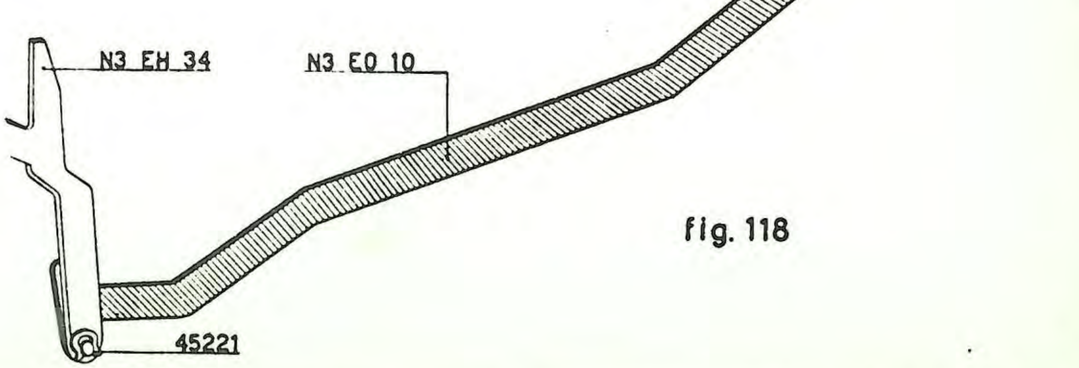


fig. 118

## 95 - Assembling the correction control lever N3 GG 42 - Division control bridge N3 GQ 23. The bracket and rocker unit N3 EQ 84.

**MC 14 D** (Figure 119)

*a*) Draw the shaft N3 G 14 out completely to the right.

*b*) Place the correction control lever N3 GG 42 in position so that its rear slot is lodged on the guide pin N3 G 9.

*c*) Attach the pin N3 Q 22 on the division control bridge N3 GQ 23 with a nut 138407.

*d*) Put the division control bridge N3 GQ 23 in place and insert the shaft N3 G 14 again. Check that the bend **P** is below the rocker N3 Q 30 (figure 121). Make sure that the step on the right side of the bridge is in the position shown in the figure in relation to the pin **B** of the current link lever N3 GV 13.

*e*) Couple the locks pull rod N3 Q 11 to the pin N3 Q 22 with a flexible clip 45221.

*f*) Place the rocker and bracket unit N3 EQ 84 in position and clamp it with:

— the shaft N3 G 14 and a screw 120302 on the left side of the machine;

— a screw 120354 on the pin N3 Q 86, placing the distance piece N3 Q 85 in between (the latter is at the side in figure 119).

*g*) Lodge the total release strut N3 GQ 81 on the pin N3 Q 22.

*h*) Hook spring N3 T 46 between the N3 GQ 81 and the rocker of N3 EQ 84.

*i*) Hook spring N3 Q 94 between N3 GQ 83 and N3 EQ 84.

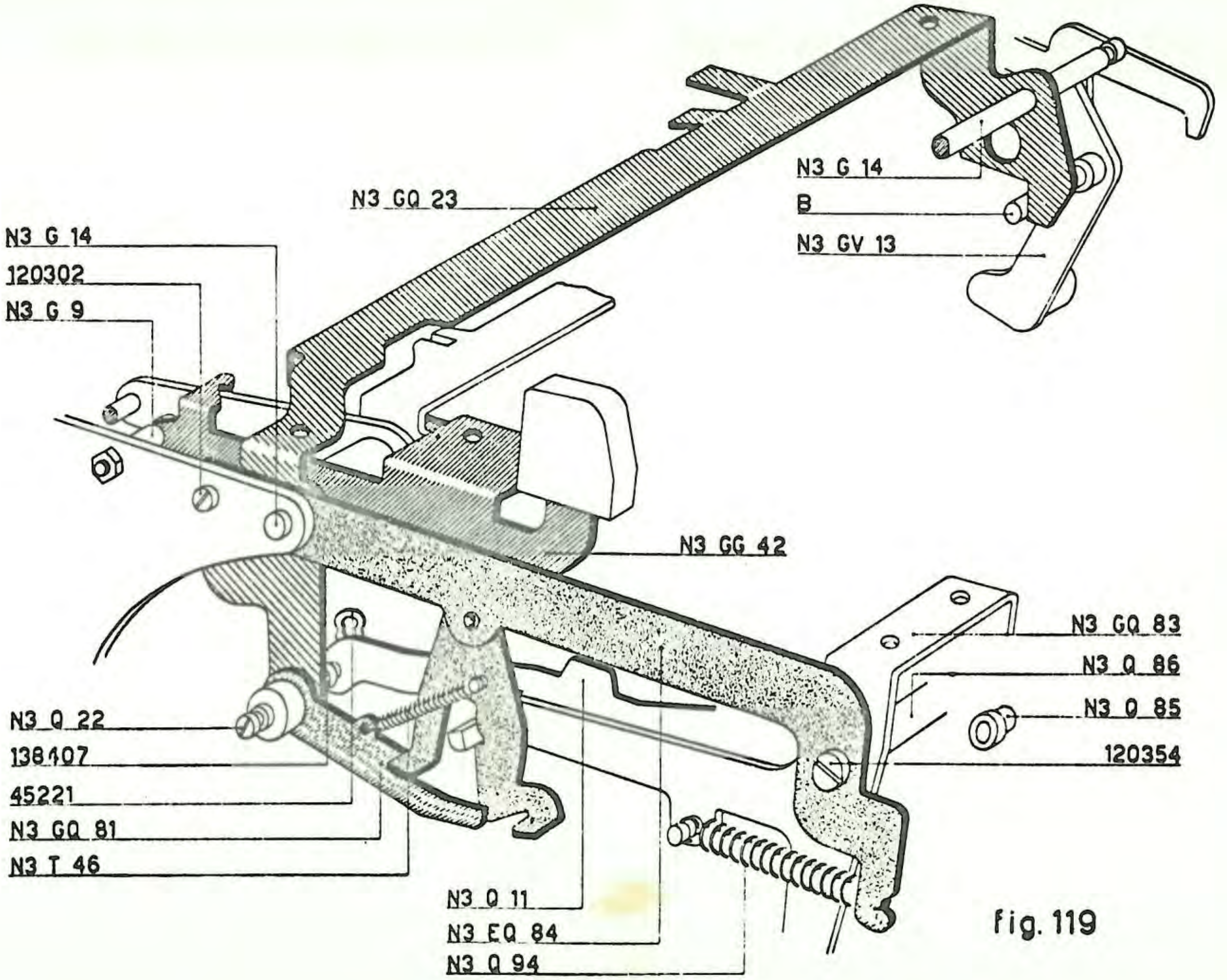

N3 GQ 23
N3 G 14
B
N3 GV 13
N3 G 14
120302
N3 G 9
N3 GG 42
N3 GQ 83
N3 Q 86
N3 Q 85
120354
N3 Q 22
138407
45221
N3 GQ 81
N3 T 46
N3 Q 11
N3 EQ 84
N3 Q 94

fig. 119

**MC 14 M - E** (Figure 120)

*a*) Draw the shaft N3 G 14 partially out on the right.

*b*) Place the correction control lever N3 GG 42 in position so that the rear slot is lodged on the guide pin N3 G 9.

*c*) Push the shaft N3 G 14 forward again.

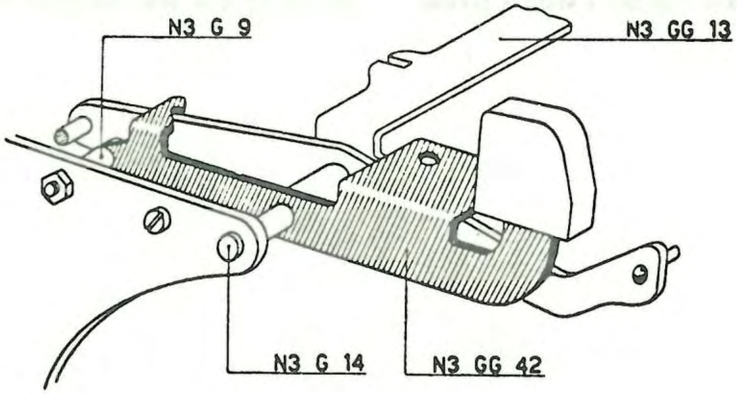


fig. 120

### 96 - Assembling the motor hook for the ovoid cam N3 EH 31 and hooking the springs N3 M 121 and N3 GQ 45.

MC 14 D (Figure 121)

*a*) Place the roller N3 N 12 in position on the motor hook N3 EH 31, securing it with a flexible clip 45221.

*b*) Place the hook N3 EH 31 in position and secure it on the accumulator control lever N3 EH 1 with a screw 125357, placing the washer 40366 in between. Make sure that the pin H rests on the upper edge of the motor hook shut off lever N3 G 4.

The control anchor N3 EH 34 should be in the position shown in the figure in relation to the roller N3 N 12.

*c*) Hook the spring with the plate in the middle N3 GQ 45 between the hook N3 EH 31 and the correction key N3 GG 42.

*d*) Hook the spring N3 M 121 between the rocker N3 Q 30 and the indicator bridge N3 EQ 33.

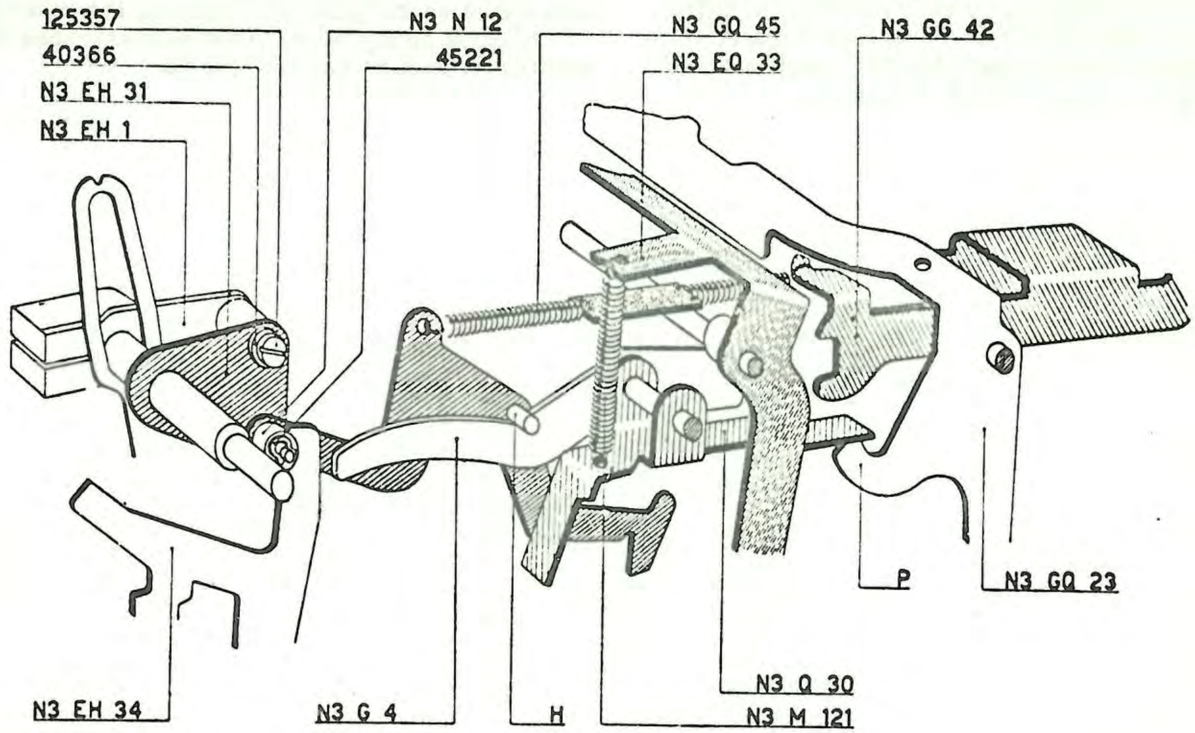

125357
40366
N3 EH 31
N3 EH 1
N3 N 12
45221
N3 GQ 45
N3 EQ 33
N3 GG 42
P
N3 GQ 23
N3 EH 34
N3 G 4
H
N3 Q 30
N3 M 121

fig. 121

## MC 14 M - E (Figure 122)

*a)* Place the roller N3 N 12 in place on the motor hook N3 EH 31 and secure it with a flexible clip 45221.

*b)* Place the hook N3 EH 31 in position and secure it to the accumulator control lever N3 EH 1 with a screw 125357, putting the washer 40366 in between.

Make sure thst the pin **H** rests on the upper edge of the motor hook shut off lever N3 G 4.

The control anchor N3 EH 34 should be in the position shown in the figure in relation to the roller N3 N 12.

*c)* Hook spring N3 H 49 between the hook N3 EH 31 and the correction key N3 GG 42.

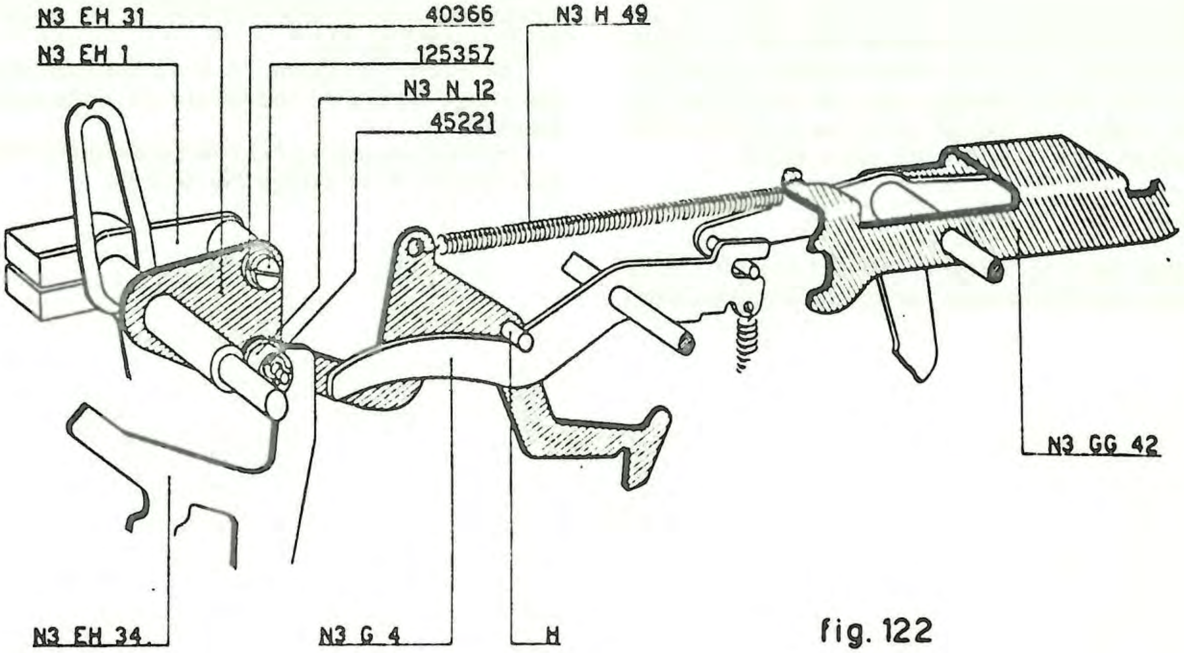

N3 EH 31
N3 EH 1
40366
125357
N3 N 12
45221
N3 H 49
N3 GG 42
N3 EH 34
N3 G 4
H

fig. 122

## 97 - Assembling the quotient accumulation control drag link N3 Q 24 and the total control recharge link N3 Q 88.

### MC 14 D (Figure 123)

*a*) Lodge the quotient accumulation control link N3 Q 24 on the pin N3 Q 22. In its rear hole the pin for the quotient accumulation control link cut off tooth N3 GQ 28 is inserted. Secure it with a flexible clip 45221.

*b*) Couple the total recharge cam N3 GQ 87 to the total control bridge N3 GQ 83 with the link N3 Q 88 which is secured with two flexible clips 45221.

### MC 14 M - E

The pieces listed in paragraph 97 for the MC 14 D are not used on the Multisumma nor on the Elettrosumma.

## 98 - Assembling the non print control drag link N3 GG 31.

### MC 14 D - M - E (Figure 124)

*a*) Introduce the non print control link N3 GG 31 on the shaft N3 G 14 on the right side of the keyboard so that the rear bend **S** is in front of the stop of the print drag link N3 G 130.

*b*) Hook the spring N V 45 between the pin **P** of the bridge N3 GG 13 and the pin **H** of the right keyboard bracket.

*c*) Hook the spring N3 T 46 between the link N3 GG 31 and the pin **P** of bridge N3 GG 13.

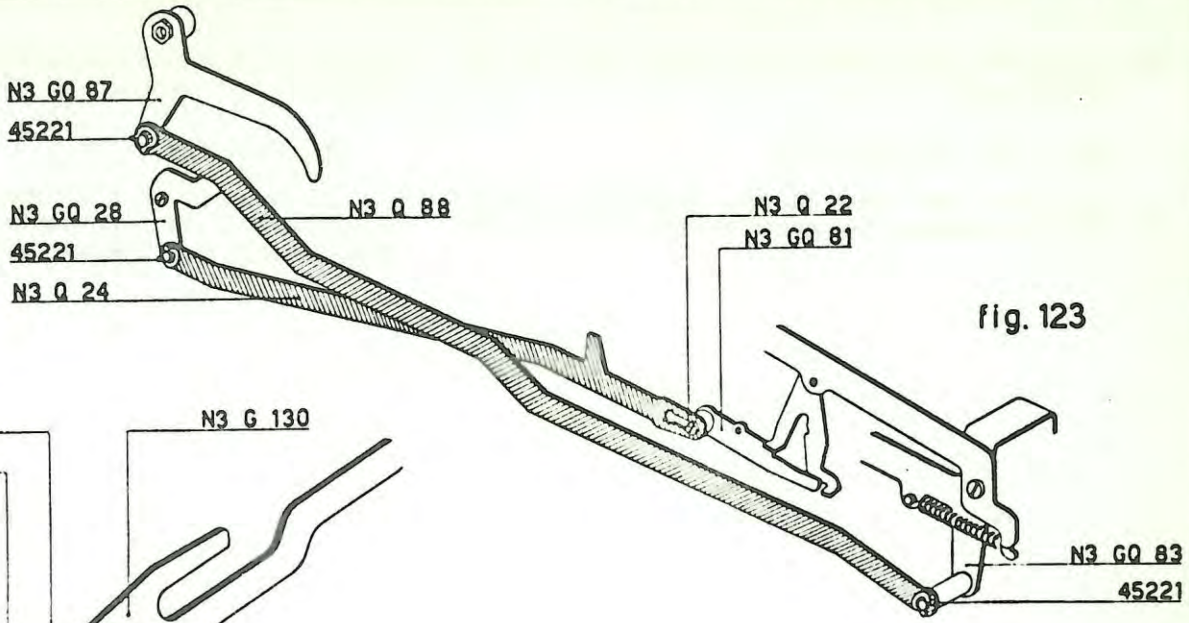


fig. 123

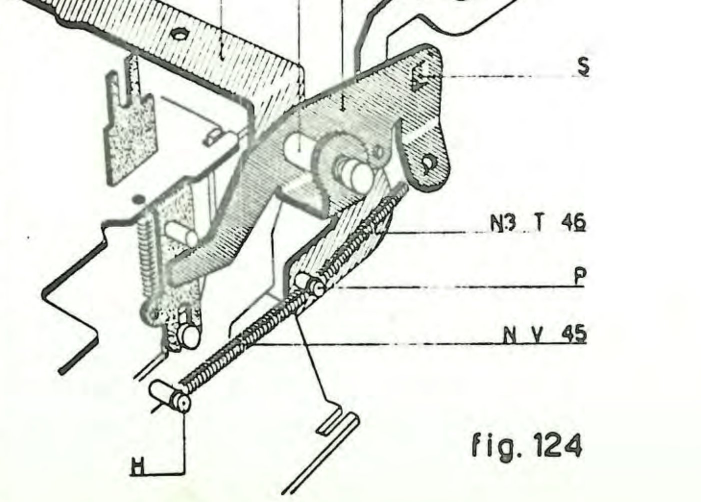


fig. 124

## 99 - Assembling the subtraction bridge N3 GM 52 (inner part).

### MC 14 D - M (Figure 125)

Place the inner part of the subtraction bridge N3 GM 52 in position at the side of the non print control link N3 GG 31 so that the pin **P** is in front of accumulator inversion anchor control link N3 GG 28.

### MC 14 E (Figure 126)

The pieces listed in paragraph 99 for MC 14 D - M are not used on the Elettrosumma. To maintain the exact measurements, place a washer 40461 on the shaft N3 G 14.

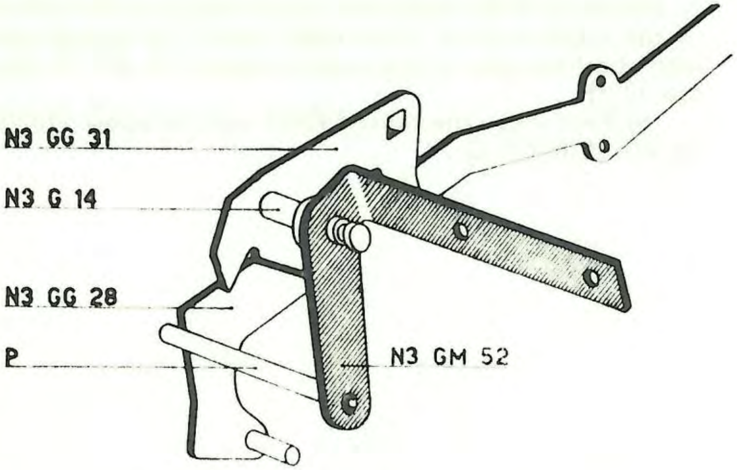


fig. 125

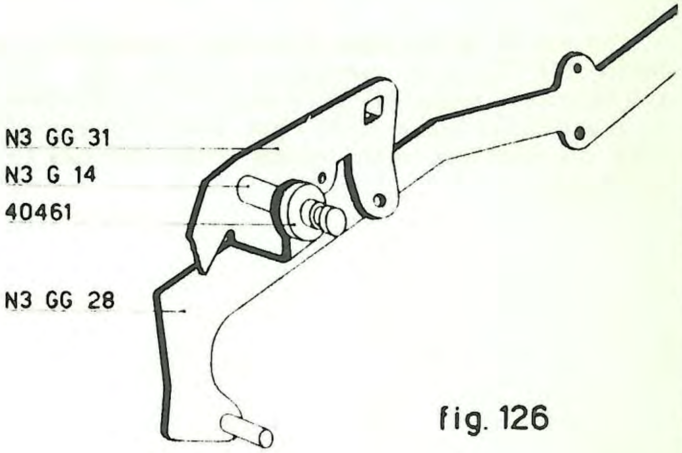


fig. 126

## 100 - Assembling the repeat transmission bracket N3 G 39 and the prolonged division control lever N3 Q 108.

### MC 14 D (Figure 127 - 127a)

*a*) Place the repeat transmission bracket N3 G 39 in position on the shaft N3 G 14 so that:
— the pin **P** of the repeat key is inserted in the front slot;
— the pin $\mathbf{P}_1$ of the stop with exact remainder control bridge N3 GQ 56 is inserted in the rear slot. To raise this latter, the bridge N3 GQ 8 must be turned backwards;
— the inclined plane of its right bend is in coincidence with the front pin of the repeat rocker N3 GN 15 (figure 127a).

*b*) Then introduce the prolonged division control lever N3 Q 108 onto the shaft N3 G 14 so that the pin $\mathbf{P}_1$ of the bridge N3 GQ 109 is inserted in its rear slot

### MC 14 M - E (Figure 128)

*a*) Place the repeat transmission bracket square N3 G 39 in position on the shaft N3 G 14 so that:
— the pin **P** of the repeat key is inserted in its front slot;
— the inclined plane of its right bend is in coincidence with the front pin of the repeat rocker N3 GN 15 (figure 127a);

*b*) Then lodge the collar 142461 with its screw 120262 on the shaft N3 G 14.

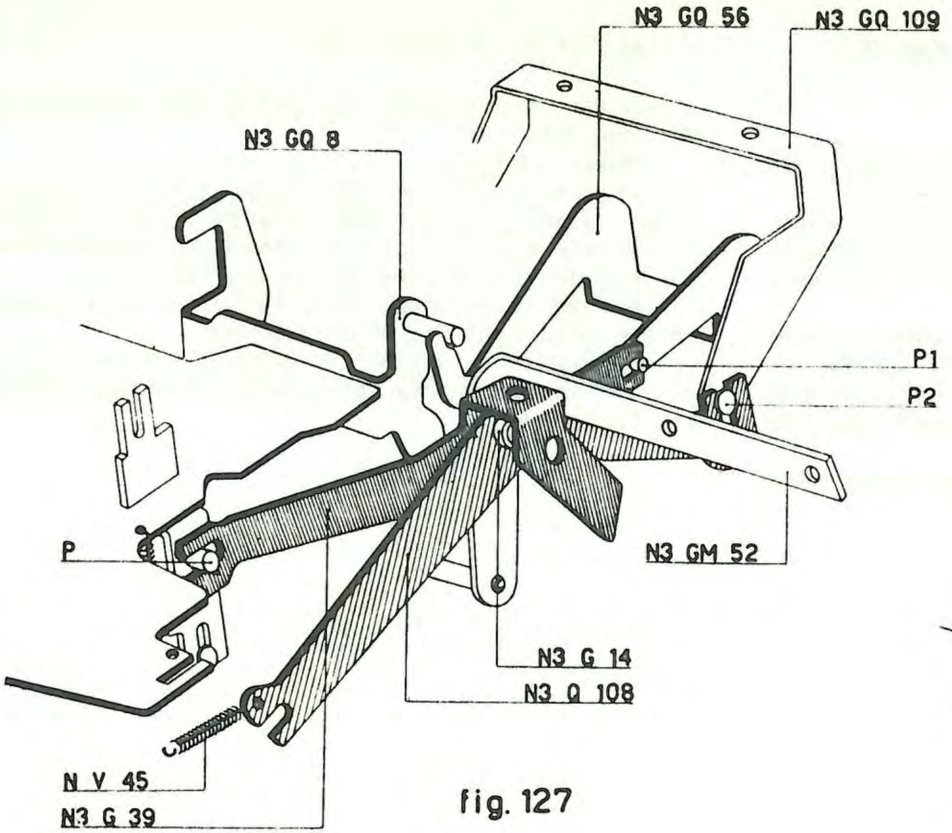


fig. 127

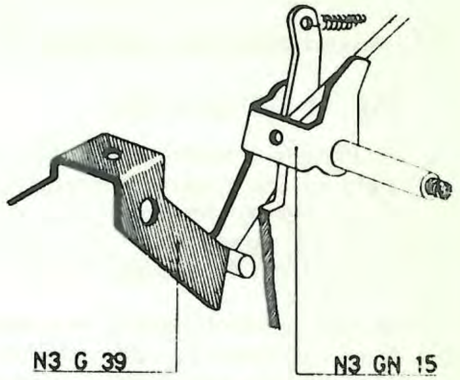


fig. 127a

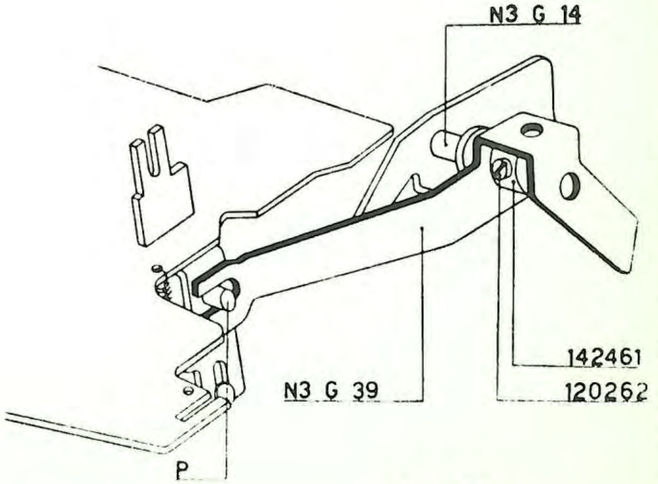


fig. 128

## 101 - Assembling the addition key N3 GG 35.

### **MC 14 D** (Figure 129)

*a*) Place the addition key N3 GG 35 in position on the right of the division bridge N3 GQ 23 so that:
— it is guided by the two special grooves for the purpose made in the upper and lower planes of the keyboard;
— the front pin **P** is lodged in the front slot of the lever N3 Q 108;
— the rear inclined plane is in coincidence with the front pin **S** of the lever for the current link N3 GV 13.

*b*) Put the washer 40461 in place and push the shaft N3 G 14 through until it rests on the outer right side of the machine.

*c*) Hook the spring N V 45 between the upper plane of the keyboard and the lever N3 Q 108.

### **MC 14 M - E** (Figure 130)

*a*) Place the addition key N3 GG 35 in position on the shaft N3 G 14.

Make sure that:
— it is guided by the two special grooves for the purpose made in the upper and lower planes of the keyboard;
— the rear inclined plane is in coincidence with the front pin **S** of the lever for the current ling N3 GV 13.

*b*) Advance the shaft N3 G 14 further until it rests on the outer right side of the machine.

*c*) Hook the spring N V 45 between the upper plane of the keyboard and the spring holder **P** of the addition key N3 GG 35.

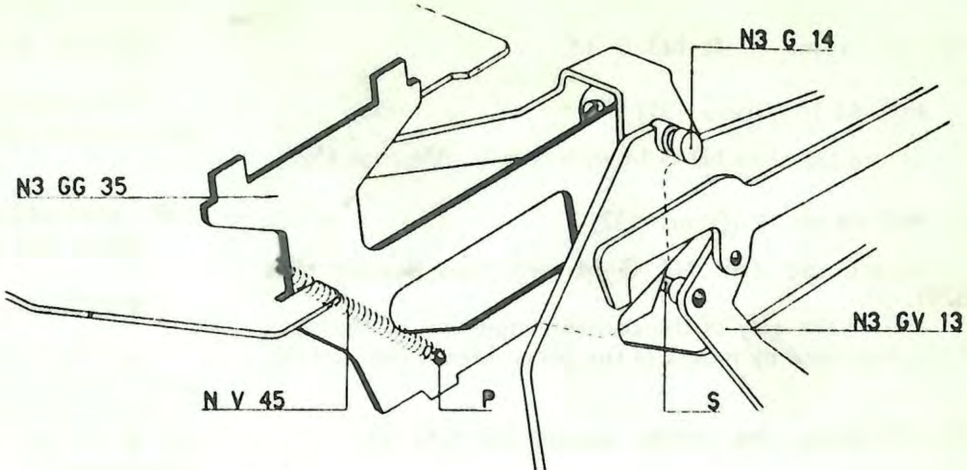


fig. 130

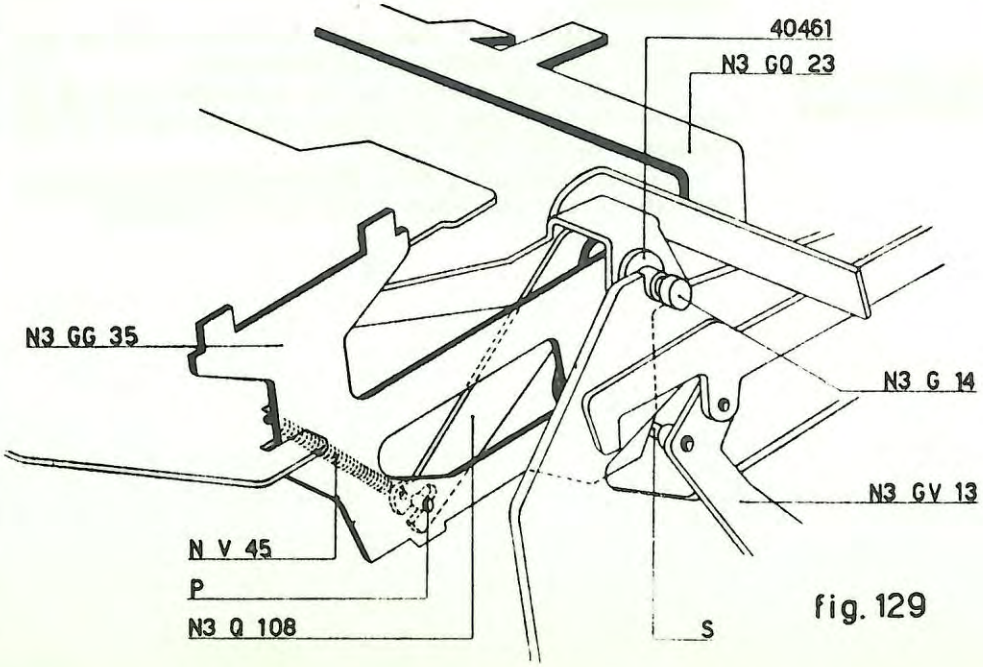


fig. 129

## 102 - Clamping shaft N3 G 14.

### MC 14 D (Figure 131)

Secure the shaft N3 G 14 with two flexible clips 45281.

### MC 14 M - E (Figure 132)

Secure the shaft N3 G 14 with two flexible clips 45281.

Adjust the play of the controls mounted on the right of the keyboard by means of the collar 142461 (figure 128).

## 103 - Hooking the bridge spring N3 GQ 23.

### MC 14 D (Figure 133)

Hook the spring N3 T 43 between the pin of the bridge N3 GQ 23 and the spring holder 136302 screwed onto the lower plate of the keyboard.

### MC 14 M - E

The pieces listed in paragraph **103** for MC 14 D are not used on the Multisumma nor on the Elettrosumma.

## 104 - Assembling and adjusting the keyboard locking plate N3 GB 37.

### MC 14 D - M - E (Figure 133).

*a*) Place the keyboard locking plate N3 GB 37 in position and clamp, it:
— onto the lower level of the keyboard with the eccentric N3 B 38 and the screw 120303 placing washer 40323 underneath;
— to the right outer side of the machine with the pin N3 G 40, placing washer 40303 underneath.

*b*) Adjust the position of the eccentric N3 B 38 so that the locking plate clears the universal bar **B** of the keyboard by 0.2 ÷ 0.4 mm.

*c*) Hook the spring M2 E 28 between the locking plate N3 GB 37 and the lower plate of the keyboard.

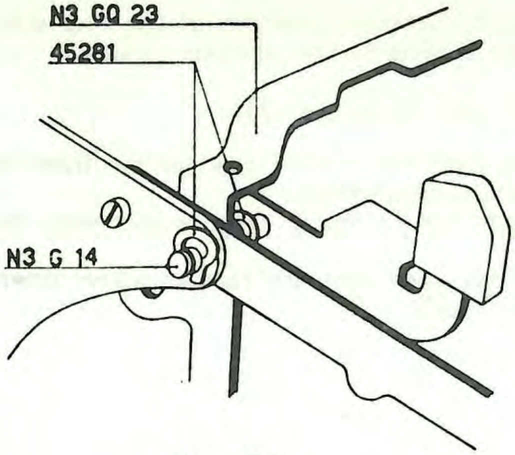


fig. 131

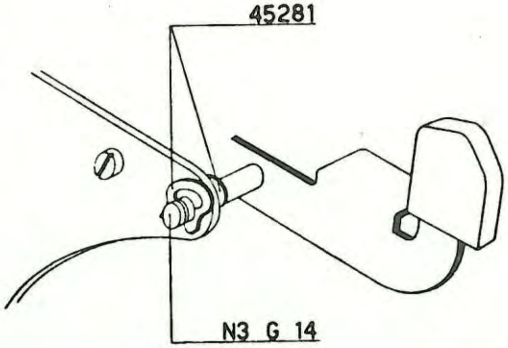


fig. 132

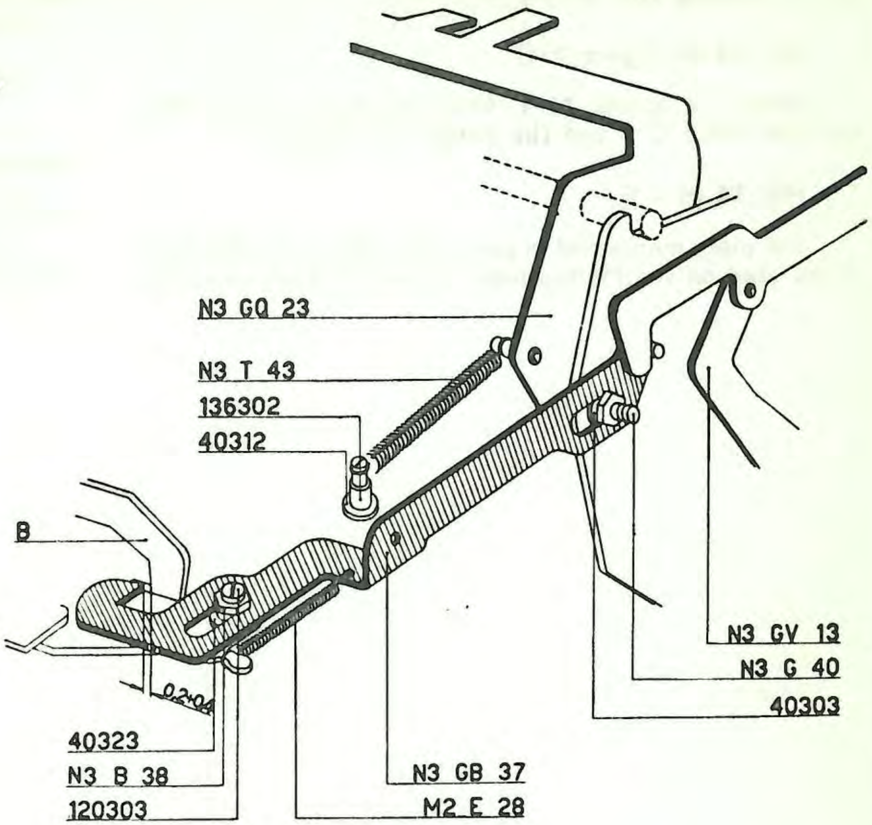


fig. 133

### 105 - Hooking the spring N V 45.

**MC 14 D** (Figure 134)

Hook the spring N V 45 between the rocker for pull rod N3 E Q 6 and the bridge N3 GQ 23.

**MC 14 M - E**

The piece mentioned in paragraph **105** for the MC 14 D is not used on the Multisumma nor on the Elettrosumma.

### 106 - Adjusting the normal position of the link controlling the closing of the electric circuit.

**MC 14 D - M - E** (Figure 135)

*a*) Push the latch N3 EG 117 towards the front of the machine with a screw driver.

*b*) The link N3 EV 12 should be in contact with the pin N3 T 26.

*c*) When these conditions are reached screw down the two screws 122302.

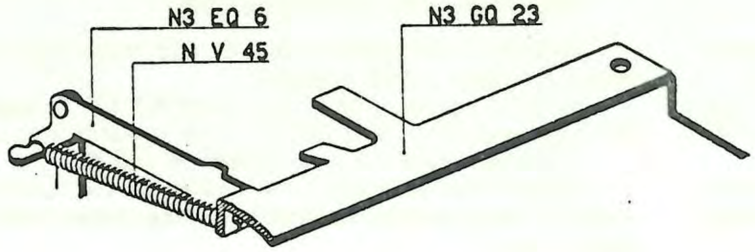


fig. 134

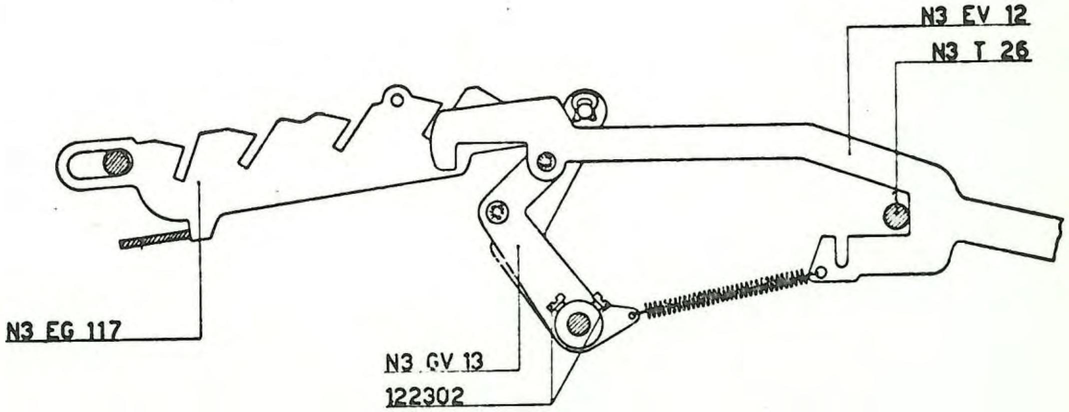


fig. 135

## 107 - Adjusting the position of the plate N3 V 15.

### MC 14 D - M - E (Figure 136)

*a*) Strike the addition key and make the motor wheel **R** reach the position shown in the figure.

*b*) Turn the lever N3 V 9 towards the front of the machine so that it hooks the plate N3 V 15. The N3 V 10 should rest on the pin **P**.

In these conditions move the plate N3 V 15 so as to obtain the clearance given in the figure. While doing this the screws **B** and **C** should be loosened.

*c*) When the adjustment is made, screw down the screw **A**.

## 108 - Adjusting the position of the link N3 V 14.

### MC 14 D - M - E (Figure 137)

*a*) Lower the grand total key and make the motor wheel **R** rotate a few degrees.

*b*) Take up the play of the lever N3 EV 12 towards the back and that of lever N3 V 14 towards the front.

*c*) Screw down the two screws **B** and **C**.

*d*) Push the lever N3 V 14 backwards and check that it has an extra stroke, in relation to the motor wheel **R**, of 0.1 mm.

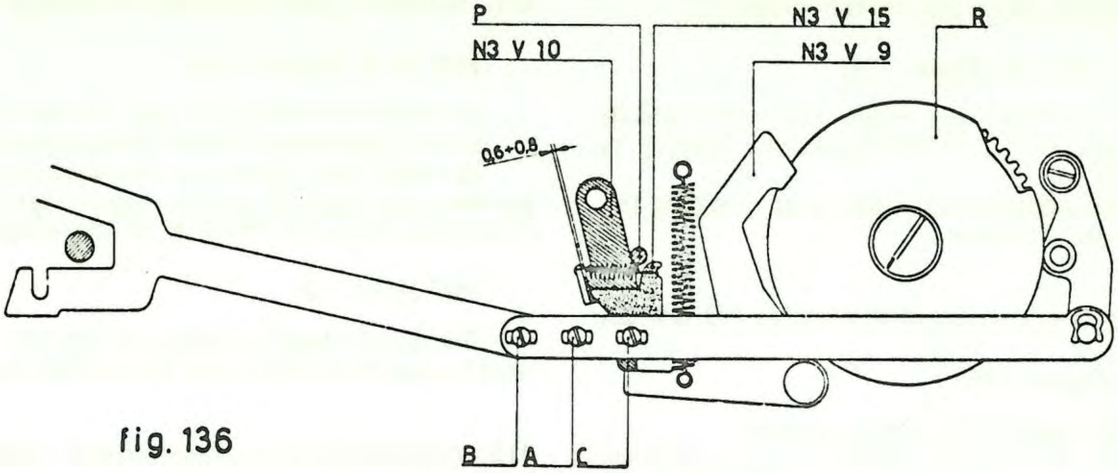


fig. 136

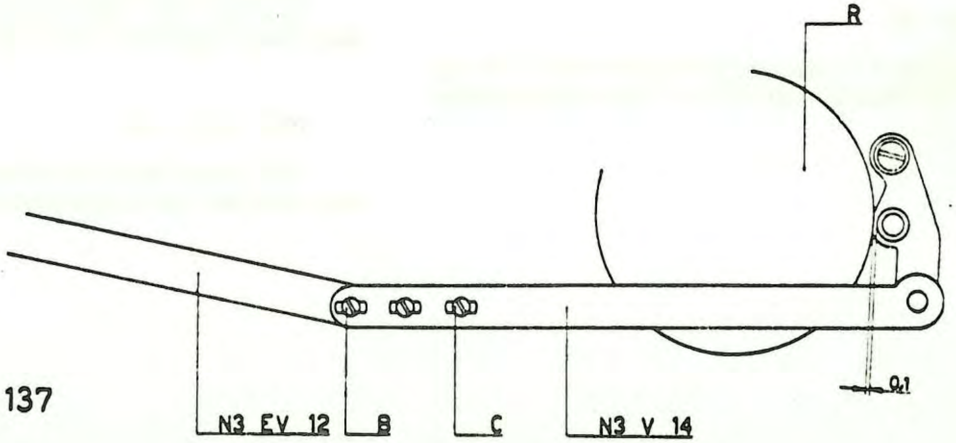


fig. 137

### 109 - Adjusting the stop pin of the latch.

**MC 14 D - M - E** (Figure 138)

*a*) Lower a total key and rotate the motor wheels by hand until the pin N3 H 128 enters the opening in the latch N3 EG 117.

*b*) Adjust the position of the pin so as to obtain the clearance given in the figure.

### 110 - Adjusting the position of the bridge N3 GQ 23.

**MC 14 D** (Figure 139)

*a*) Keep the machine in normal position.

*b*) Check that is a clearance of 0.2 ÷ 0.4 mm between the lower right shank of the bridge N3 GQ 23 and the pin **P** of the N3 GV 13. If necessary correct the clearance by flexing the bridge itself.

**MC 14 M - E**

The pieces listed in paragraph **110** for MC 14 D are not used on the Multisumma nor on the Elettrosumma.

### 111 - Adjusting the position of bridge N3 GQ 33.

**MC 14 D** (Figure 139)

*a*) Keep the machine in the normal position.

*b*) Bring the sector N3 EH 115 to subtraction position.

*c*) Check that there is a clearance of 0.8 ÷ 1.2 mm between the roller **R** and the upper edge of the sector. If required bend the shank **H** of the bridge N3 GQ 23.

**MC 14 M - E**

The pieces listed in paragraph **111** MC 14 D are not used on the Multisumma nor on the Elettrosumma.

### 112 - Adjusting the position of the rocker N3 Q 30.

**MC 14 D** (Figure 140)

*a*) Hook up the division control key.

*b*) Check the distance given in the figure. If necessary bend the shank **A** of the rocker N3 Q 30.

**MC 14 M - E**

The pieces listed in paragraph **112** for MC 14 D are not used on the Multisumma nor on the Elettrosumma.

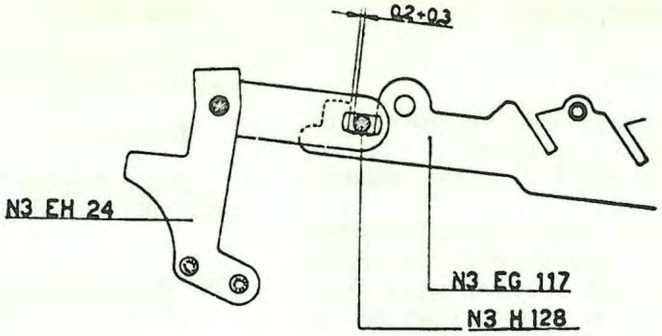


fig. 138

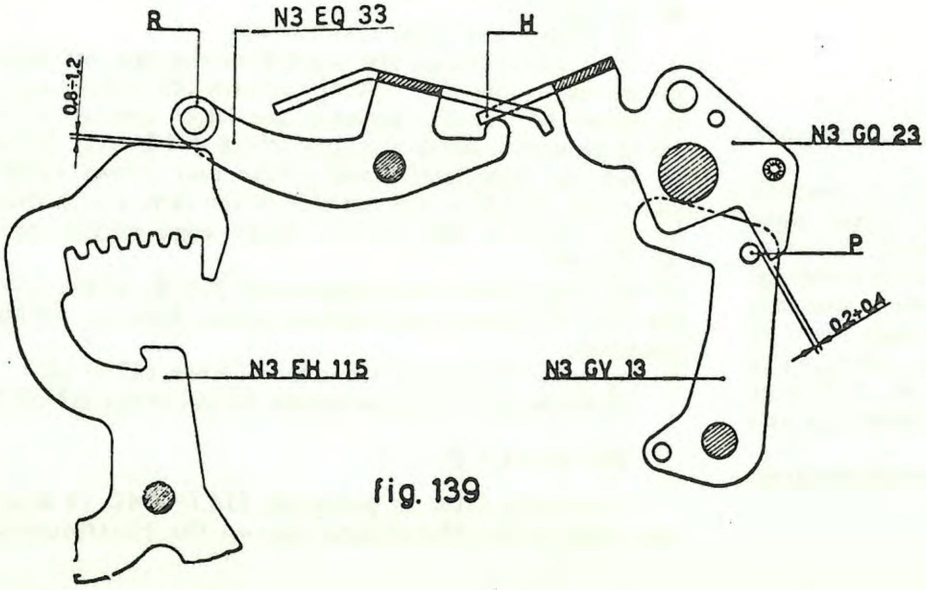


fig. 139

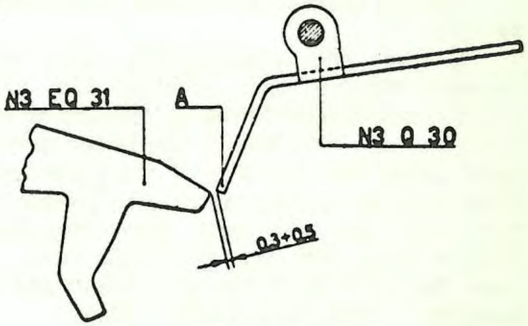


fig. 140

## •113 - Assembling the vertical racks.

### MC 14 D (Figure 141)

*a*) Lower the grand total key; work the machine by hand, clearing the accumulator in positive.

*b*) Lift the shank of the N3 F 2 of the negative balance unit.

*c*) Strike the sub total key. Make the machine complete the entire first cycle. Continue with the second and stop when the horizontal rack of special signs stops.

*d*) Place the vertical racks in position from left to right in the following order:

- special signs rack;
- numbers racks, taking care of the position of the racks with characters and a stop or with characters and a comma, according to whether the machine is:

N 00.000.000.000
of K 000.000.000.00;

- multiplication printing rack;
- division printing rack.

Keeping them in this order, lodge them on the guide bar N3 T 7.

e) Place the type carrying racks unit in position between the horizontal racks so that the special signs vertical rack is outside the corresponding horizontal rack. Straighten the unit making the lower part of the vertical racks enter into the slits of the guide comb. Without bringing them to the transmission pinions, make them go down until the first tooth above (towards the type) is brought flush with the horizontal racks. At this point mesh the racks with the gear pinions and lower the bar, securing it with four screws 120261.

*f*) Bring the machine back to the normal position.

### MC 14 M

See paragraph **113** for **MC 14 D.** The type carrying rack for division is not used.

### MC 14 E

See paragraph **113** for **MC 14 D.** The type carrying racks for division and multiplication are not used.

## 114 - Assembling and adjusting the angular position of the cam N3 EQ 1.

### MC 14 D (Figure 142)

*a*) Place the cam N3 EQ 1 in position on the shaft of the main cam after having screwed two screws 122301 on its hub.

*b*) Rotate the main cam for 90°.

*c*) In this position the point **P** of the cam N3 EQ 1 should lower the shank **A** of the arm N3 GQ 35 so as to cause the hooking between the latter and the hook N3 Q 36 with a safety clearance of 0.8 ÷ 1.2 mm. Screw in, but not completely, one of the two screws 122301 and check that the axial position of the cam is such that:

- the roller **R** acts on the upper edge of the lever N3 GQ 87;
- the edge of the cam acts on the hub $\mathbf{R}_1$ of the lever N3 EQ 31 (when the machine comes back to normal position);
- the roller **R** acts on the edge of hook N3 Q 36.

*d*) Screw down the two screws 122301 of the N3 EQ 1.

### MC 14 M - E

The pieces listed in paragraph **114** for **MC 14 D** are not used on the Multisumma nor on the Elettrosumma.

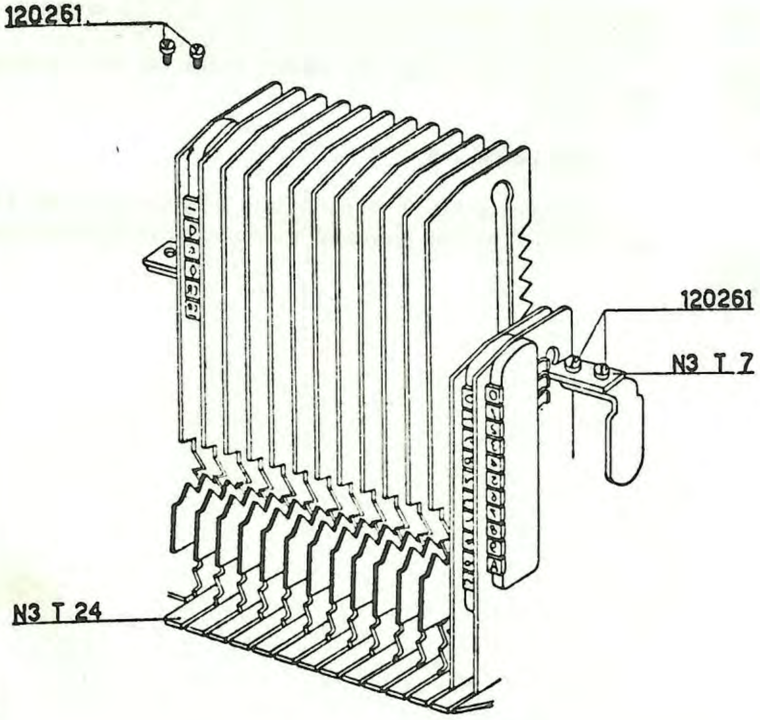


fig. 141

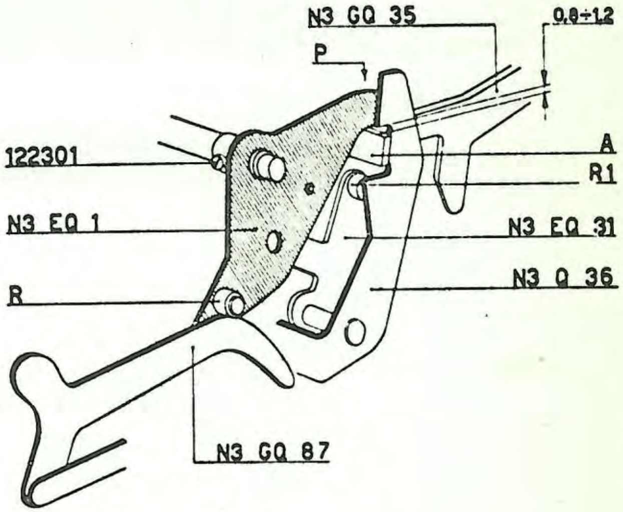


fig. 142

## 115 - Assembling the quotient accumulating pull rod N3 EQ 25.

### MC 14 D (Figure 143)

*a*) Hook the spring N3 1 12 between the pull rod N3 EQ 25 and its drag hook.

*b*) Place the pull rod N3 EQ 25 in position so that its ends fit respectively on the pin **P** of the tooth N3 GQ 28 and on the pin $P_1$ of the cam N3 EQ 1.

Secure the N3 EQ 25 with a flexible clip 45221.

### MC 14 M - E

The pieces listed in paragraph **115** for the **MC 14 D** are not used on the Multisumma nor on the Elettrosumma.

## 116 - Adjusting the position of bridge N3 GQ 83.

### MC 14 D (Figure 144)

Turn the main cam by hand and check that at the end of the forward stroke the N3 GQ 83 engages the N3 GQ 82 with an extra path of 1.5 ÷ 3 mm.

If required, bend the lower shank **A** of the bridge N3 GQ 83.

### MC 14 M - E

The pieces listed in paragraph **116** for the **MC 14 D** are not used on the Multisumma nor on the Elettrosumma.

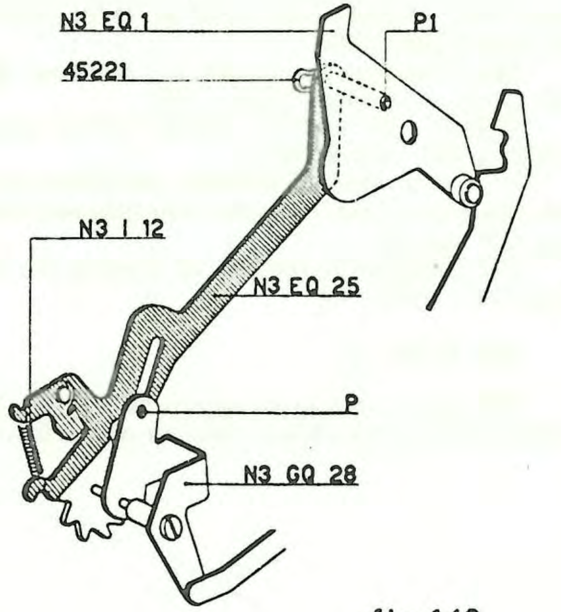


fig. 143

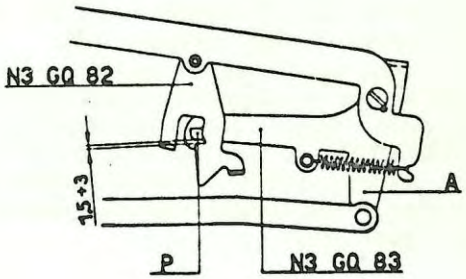


fig. 144

## 117 - Adjusting the quotient accumulating and the slide return.

### MC 14 D (Figures 145 - 146 - 146a - 146b)

*a*) Clear the accumulator in positive.

*b*) Raise the shank of the N3 F 2 of the negative balance unit.

*c*) Partially screw in one of the screws of the toothed wheel N3 GM 75 (figure 145).

*d*) Enter the slide completely with any number and mine zeros.

*e*) Operate the division control key and make the main cam accomplish a short stroke (about 15°) until the fixed tooth N3 GQ 27 engages with the quotient accumulation wheel N3 GQ 38 (figure 145).

*f*) In these conditions the number «6» of the division rack should be aligned with the zeros of the type carrying racks. As only one of the screws of the toothed wheel N3 GM 75 has been screwed in and only partially, the rack can be raised or lowered, keeping the quotient accumulation wheel steady, until the desired position is reached (figure 145).

Screw down the two screws holding the toothed wheel N3 GM 75.

Wind spring N3 Q 48 for one turn; hook it to the tooth **D** of the N3 GQ 38 and the pin **A** of the ribbon lift crank (figure 145).

*g*) Continue rotating the main cam. The addition cycle follows that of substraction and the slide is restored.

The latter should travel a sufficient distance to hook onto the movable tooth with an extra path of 0.1 ÷ 0.2 mm (figure 146a).

The condition is reached by adjusting the square N3 Q 42 as required (figure 146).

*h*) Bring the machine back to normal position after releasing the division key.

*i*) Enter a series of numbers and check that there is the clearance shown in figure 146b between the tooth **A** and the rack **D**.

The condition is reached by bending the bend **P** as required (figure 146).

### MC 14 M - E

The parts listed in paragraph **117** for the **MC 14 D** are not used on the Multisumma nor on the Elettrosumma.

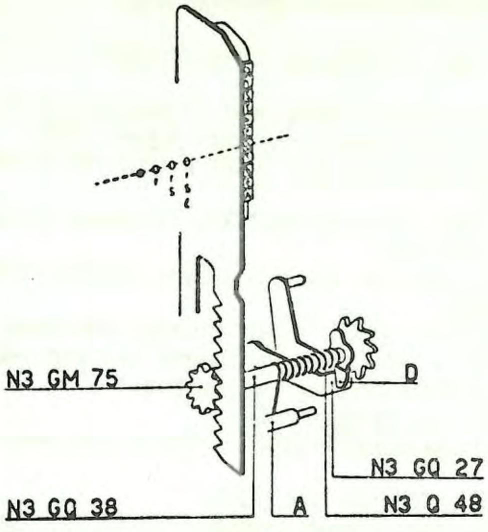


fig. 145

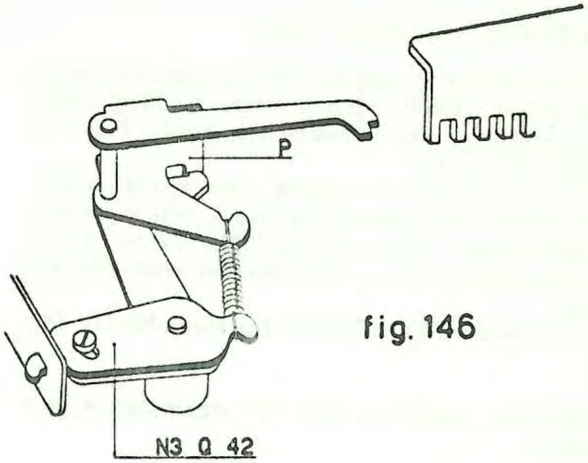


fig. 146

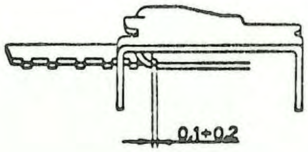


fig. 146a

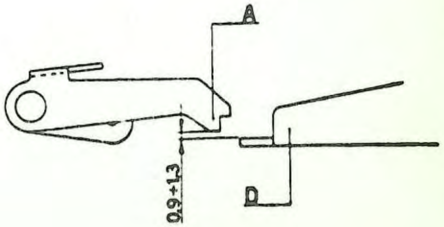


fig. 146b

## 118 - Assembling the motor.

MC 14 D - M - E (Figure 147)

*a*) Place the motor in position on the base and clamp it with four screws 120501, placing washers 40514 underneath. Allow a slight play between the pinion N3 V 23 and the wheel N3 V 21.

*b*) With the wheels in neutral, make the starter control lever N3 GV 142 rest on the tang **C** which projects from the motor plate. Turn the shaft N3 GV 61 so that there is a clearance of 0.6 ÷ 0.8 mm between the platinum points.

Screw down the screw 120302 of the lever N3 GV 142.

## 118 bis - Only for machines with 36° accumulators (see part two).

## 119 - Assembling the ribbon holding unit.

MC 14 D - M - E (Figures 147 and 148)

*a*) Place the ribbon holding unit in position on the left inner side of the machine so that (figure 147):

— the pin of the lever **L** lodges in the proper slot in the jaws N3 EL 18;

— the slip for the clutch spring N3 L 14 enters in the proper slot in the side.

*b*) Clamp the unit to the side of the machine with two screws 120302.

*c*) Make the link N3 GL 1 pass through the vents **F** in the inner side of the machine (figures 147 and 148).

Couple the ribbon holding unit so that:

— the pin **P** acts on the hook **G**;

— the pin $P_1$ of the advance tooth lodges in the hole in the link.

Secure with a flexible clip 45221.

*d*) Place the right ribbon holding unit on the right outer side of the machine and couple it to the link N3 GL 1 following the same instructions as for the left.

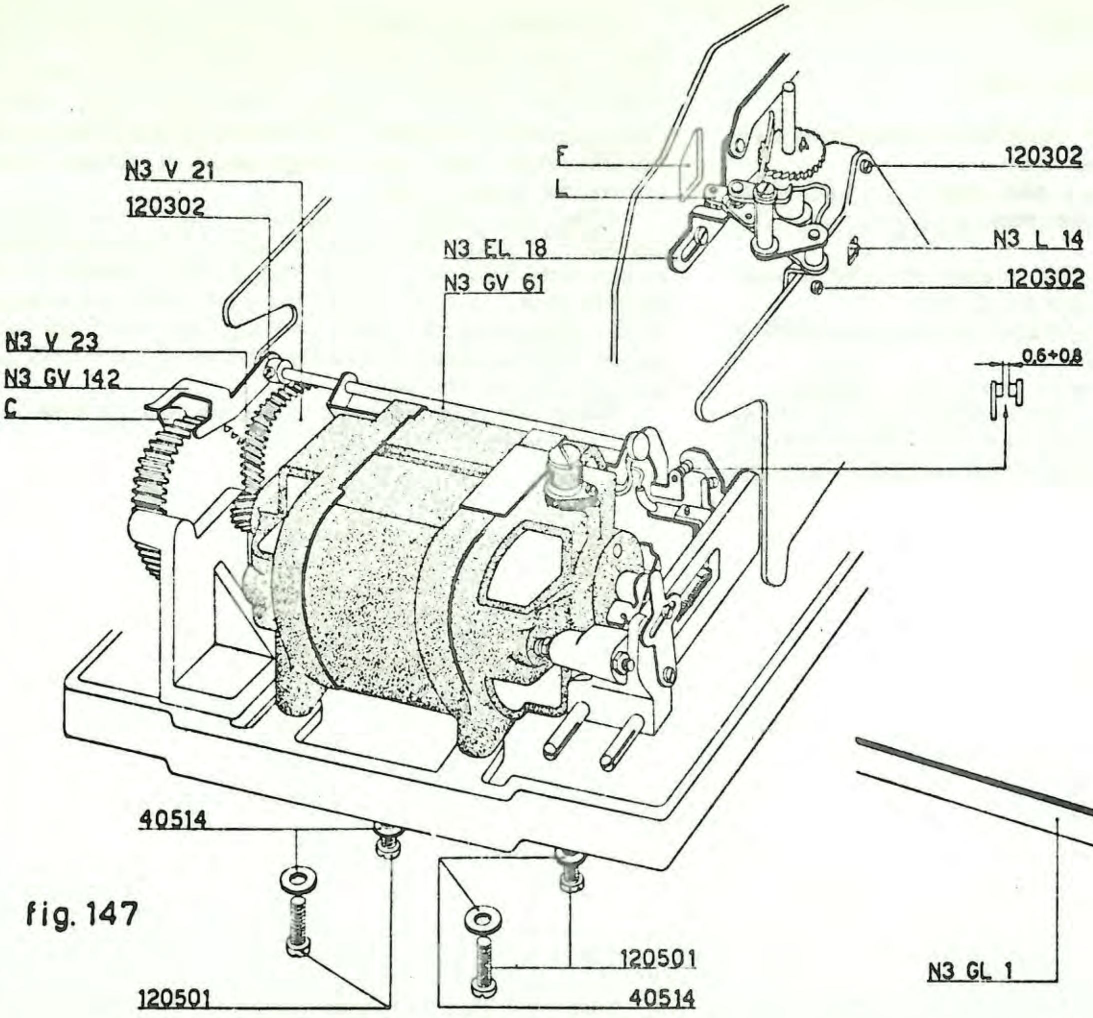


fig. 147

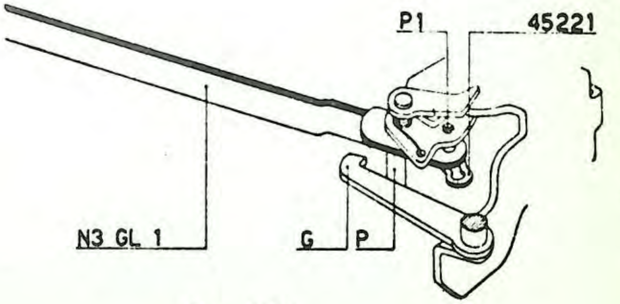


fig. 148

## 120 - Assembling the carriage.

MC 14 D - M - E (Figure 149)

*a*) Place the carriage in position between the two outer sides of the machine so that:

— the front slots of its two side pieces are lodged in the proper grooves in the sides connecting column of the machine;

— the line spacing control link enters into the proper guide and passes under the pin N3 U 14;

— the type carrying racks is lodged in the corresponding guide of the comb N3 U 5.

*b*) Secure the carriage with two screws 120402.

*c*) Adjust the position of the eccentric pin N3 U 14. When the machine is set going, the line spacing control lever should make the toothed wheel of the platen trip one tooth.

*d*) Adjust the position of the carriage and of the square shaft which carries the comb N3 U 5. There should be a clearance of 0.1 ÷ 0.3 mm between the bottom of the slits of the comb and the type racks. When this adjustment has been made correctly, clamp the screws 120402 which hold the carriage and the screws which secure the square shaft.

Clear the machine in positive. Raise the shank of the N3 F 2; strike the sub total key and make the motor wheel turn until the end of the forward stroke of the second cycle. In this way all the type racks are brought to the nine position. Make sure that the racks are completely free to slide; if necessary move the comb N3 U 5 by adjusting on the slots.

Bring the machine back to the normal position.

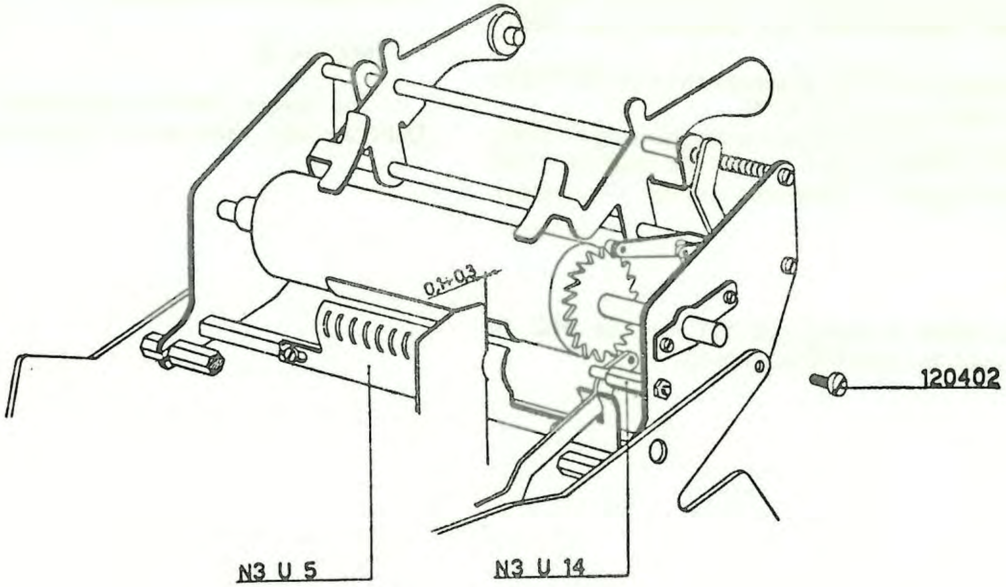


fig. 149

## 121 - Assembling the drag link N3 M 248 and the bridge N3 GM 63.

### MC 14 D - M (Figure 150)

*a*) Place the escapement control link N3 M 248 in position on the outer right side of the machine, securing it with the stud 1263038 with the distance piece 40307 in between.

Hook the spring N3 M 123 between the link N3 M 248 and the spring holding pin N3 G 40.

*b*) Place the repeat and multiplication printing hooking control bridge N3 GM 63 in position on the shaft N3 M 64 as shown in the figure. Afterwards put on the washer 40308.

### MC 14 E

The pieces listed in paragraph **121** for the **MC 14 D-M** are not used on the Elettrosumma.

## 122 - Assembling the arm N3 EM 73.

### MC 14 D - M (Figure 150)

Introduce the roller carrying arm N3 EM 73 into the hole in the right outer side of the machine, positioning it as shown in the figure.

### MC 14 E

The pieces listed in paragraph **122** for the **MC 14 D-M** are not used on the Elettrosumma.

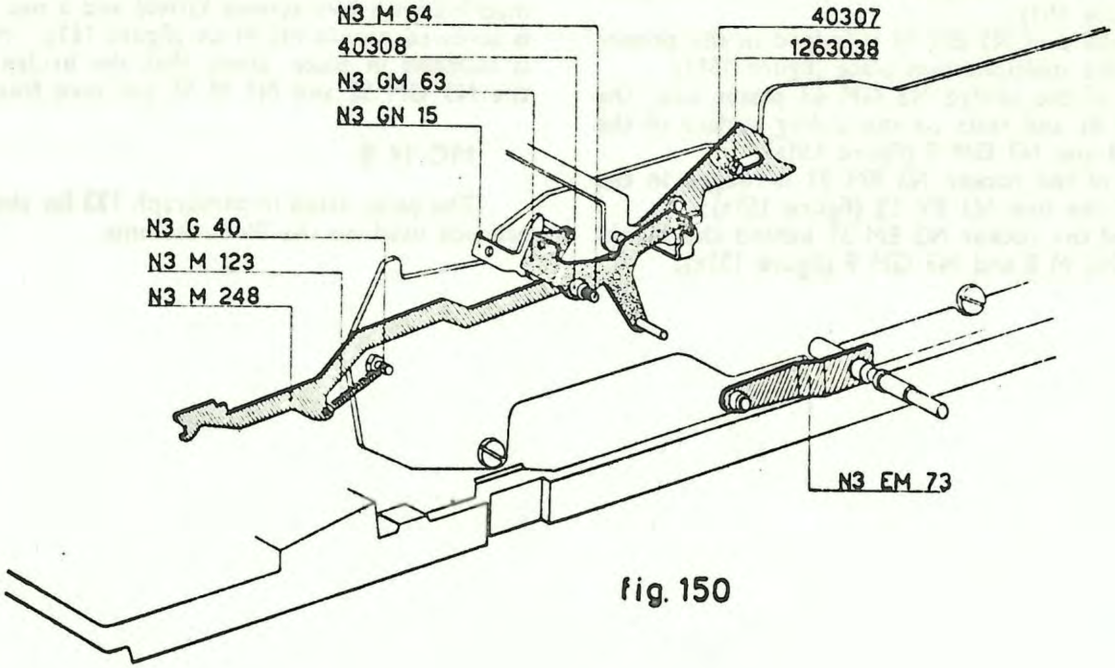

N3 M 64
40308
N3 GM 63
N3 GN 15
40307
1263038
N3 G 40
N3 M 123
N3 M 248
N3 EM 73

fig. 150

## 123 - Assembling the multiplication unit.

### MC 14 D - M (Figures 151 - 151a - 151b - 151c)

*a*) Fix the multiplication unit on the right outer side of the machine making sure that:

— the pin N3 M 64 is lodged in the hole of the plate N3 M 60 (figure 151);

— the pin of the arm N3 EM 73 is lodged in the proper hole made in the multiplication plate (figure 151);

— the pin H of the bridge N3 GM 63 passes over the rocker N3 EM 31 and rests on the sliding surface of the sliders N3 M 8 and N3 GM 9 (figure 151a);

— the pin $P_1$ of the rocker N3 EM 31 is lodged in the proper slot of the link N3 EV 12 (figure 151a);

— the pin P of the rocker N3 EM 31 behind the shanks of the sliders N3 M 8 and N3 GM 9 (figure 151a);

— the front part of the link N3 EM 248 is under the pin P of the plate N3 GM 3 (figure 151b).

*b*) Connect the two arms N3 GM 52 and N3 M 55 with two screws 120262 (figure 151c).

*c*) Hook the spring N3 G 51 between the bridge N3 GM 63 and the arm N3 EM 265 (figure 151c).

*d*) Clamp the multiplication unit to the base of the machine with two screws 120406 and a nut 138305 which is screwed on pin N3 M 64 (figure 151). When the unit is clamped in place, check that the bridge composed of the N3 GM 52 and N3 M 55 can turn freely.

### MC 14 E

The parts listed in paragraph **123** for the **MC 14 D-M** are not used on the Elettrosumma.

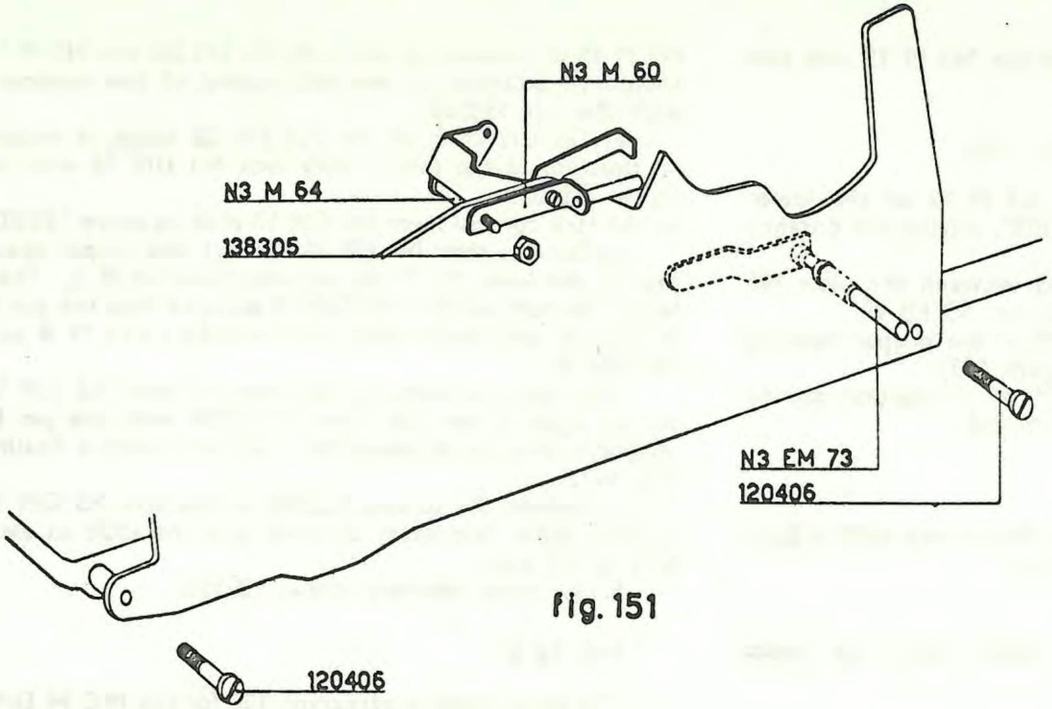


fig. 151

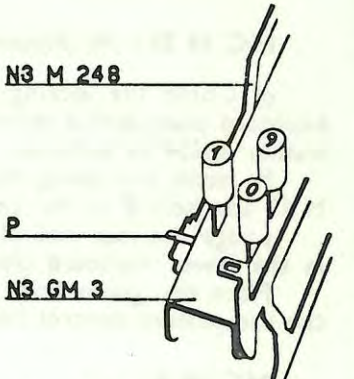


fig. 151b

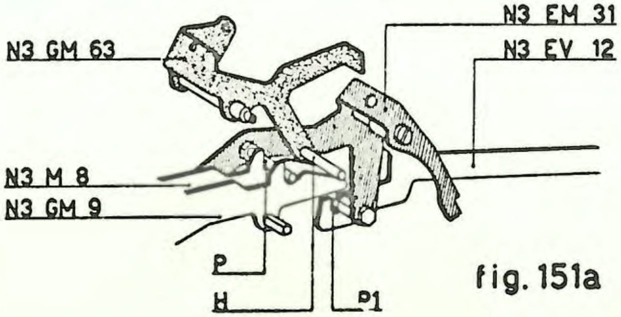


fig. 151a

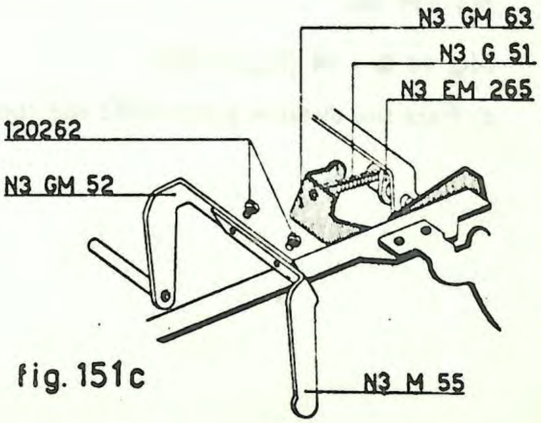


fig. 151c

## 124 - Assembling the locking plate N3 M 19 and the plate N3 M 99.

### MC 14 D - M (Figures 152 - 153)

*a*) Clamp the locking plate N3 M 19 on the lower keyboard plate with a screw 1263031, placing the distance washer 40334 in between.

*b*) Hook the spring N3 T 45 between the plate N3 M 19 and hole **F** in the universal bar N3 EB 28.

Lodge the lock rod N3 M 99 in the proper opening in the lower keyboard plate (figure 153).

Place the guide lever N3 M 49 in position astride the escapement control link N3 M 248.

### MC 14 E

The parts listed in paragraph **124** for the **MC 14 D-M** are not used on the Elettrosumma.

## 125 - Assembling the lever with shaft for locks N3 EM 20.

### MC 14 D - M (Figure 153)

*a*) Place the distance piece 40452 and the left bracket N3 M 15 in position on the shaft N3 EM 20; the N3 M 15 should be attached to the left bracket of the keyboard with the nut 138305.

*b*) On the shaft of the N3 EM 20 lodge in order:
— the arm of the tenth entry lock N3 GM 18 with its screw 122302;
— the lock control lever N3 GM 17 with its screw 122302.

*c*) Pass the shaft N3 EM 20 through the proper openings in the lever N3 M 49 and the plate N3 M 2. Then lodge the control arm N3 GM 14 on it so that the pin **P** is beyond the front stops of the sliders N3 M 8 and N3 GM 9.

Take care to keep the lock control lever N3 GM 17 to the right of the lock lever N3 M 99 with the pin $P_1$ lodged in the slot of the latter. Secure it with a flexible clip 45221.

*d*) Loosen the screws 122302, of the arm N3 GM 14 a little; move this latter so as to give the shaft an axial play of 0.2 mm.

Screw down the two screws 122302.

### MC 14 E

The parts listed in paragraph **125** for the **MC 14 D-M** are not used on the Elettrosumma.

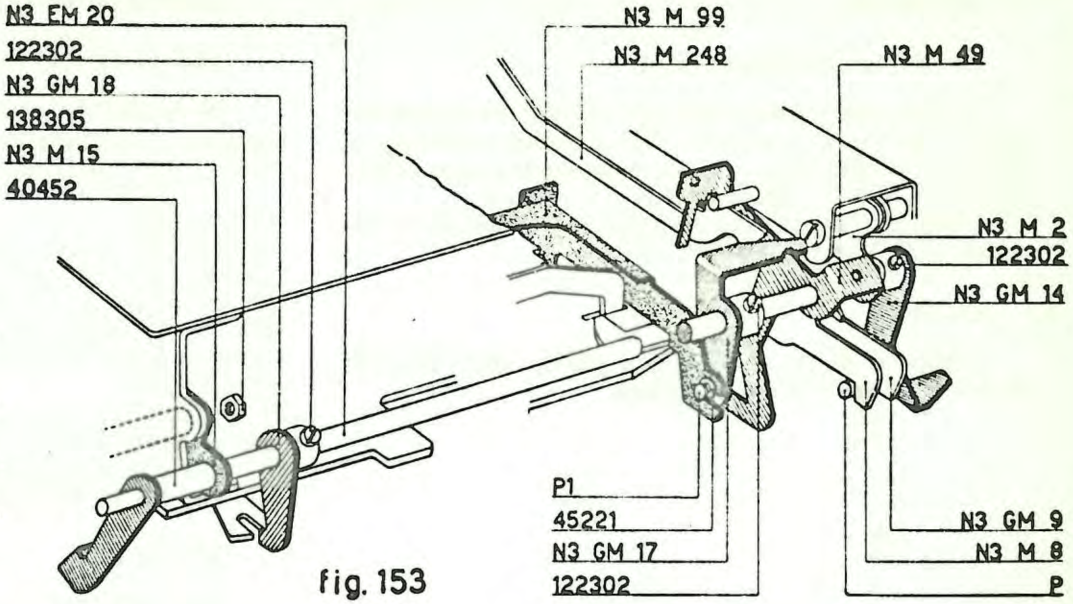


fig. 153

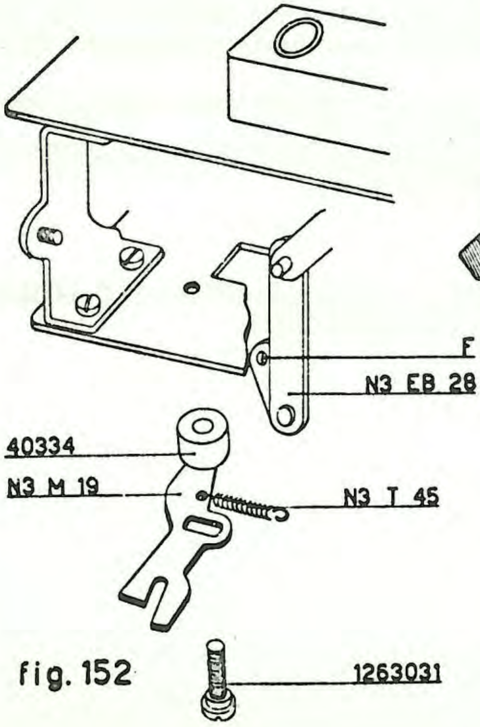


fig. 152

## 126 - Adjustment of the angle of the shaft with lever N3 EM 20.

### MC 14 D - M (Figure 154)

Keeping the pin P of the arm N3 GM 14 against the slider stops N3 M 8 and N3 GM 9, adjust the angle of the lever N3 EM 20 so that it is under the tang of the locks plate N3 G 102 and 0.4 ÷ 0.6 mm away.

When the adjustment is completed, screw down the screws 122302 of the N3 GM 14.

### MC 14 E

The parts listed in paragraph 126 for MC 14 D-M are not used on the Elettrosumma.

## 127 - Adjusting the axial position of the locking control lever N3 GM 17.

### MC 14 D - M (Figures 155 - 155a).

*a*) Adjust the axial position of the lever N3 GM 17 so that its coupling to the lock rod N3 M 99 in no way hinders the N3 M 99 itself.

N3 GM 17 and N3 M 99 should, therefore, be parallel (figure 155).

*b*) Still keeping the pin P of the arm N3 GM 14 against the stops of the sliders N3 M 8 and N3 GM 9 (as for adjusting N3 GM 2 - figure 154) push the lever N3 GM 17 backwards so that the shank A of the rod N3 M 99 barely touches the keyboard locks plate N3 GB 37 (figure 155a).

Clamp the N3 GM 17 to the shaft, screwing down the screw 122302 (figure 155).

c) Hook the spring N3 V 52 between the N3 GM 17 and the N3 M 49 (figure 155).

### MC 14 E

The parts listed in paragraph 127 for MC 14 D-M are not used on the Elettrosumma.

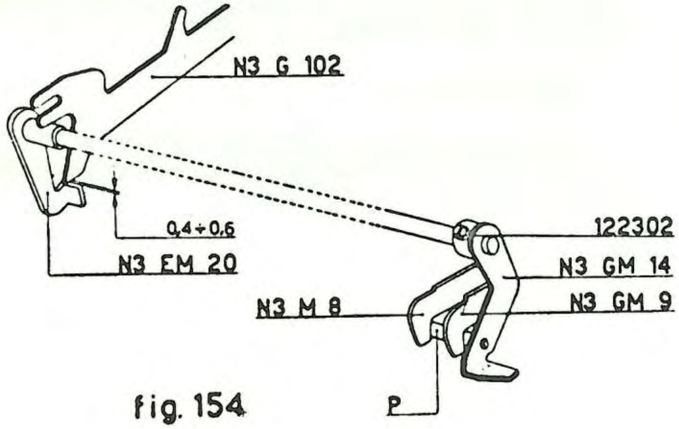


fig. 154

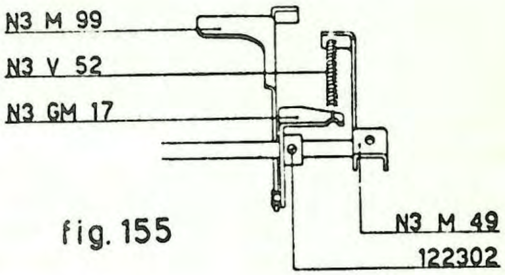


fig. 155

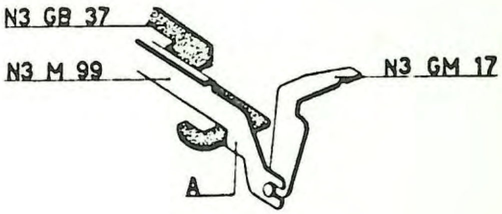


fig. 155a

## 128 - Adjusting the locking plate N3 M 19.

### MC 14 D - M (Figures 156 - 156a - 156b)

Enter stop section to capacity slide so that the plate N3 M 19 is brought into the work radius. Make sure that the pin $P_1$ of the arm N3 GM 14 is against the stops of the slides. Adjust the axial position of the N3 GM 18 so that it is meshed, for its entire thickness, with the plate N3 M 19.

The tollerance is such that the plate N3 M 19 may project 0.2 mm on the right of the arm (figure 156a).

As regards angular position, the arm N3 GM 18 should clear the plate N3 M 19 by 0.4 ÷ 0.6 mm (figure 156b).

Screw down the screw 122302.

### MC 14 E

The pieces listed in paragraph 128 for the **MC 14 D-M** are not used on the Elettrosumma.

## 129 - Assembling the reciprocal multiplication and automatic total lock bridge N3 Q 91.

### MC 14 D (Figure 157)

Before assembling the pieces mentioned above, operate the division so as to avoid interference from the lever N3 Q 11.

Place the bridge N3 Q 91 in position so that the slot of its right arm is on the pin **P** of the N3 EM 20. Secure it with a flexible clip 45221.

### MC 14 M - E

The pieces listed in paragraph 129 for the **MC 14 D** are not used on the Multisumma nor on the Elettrosumma.

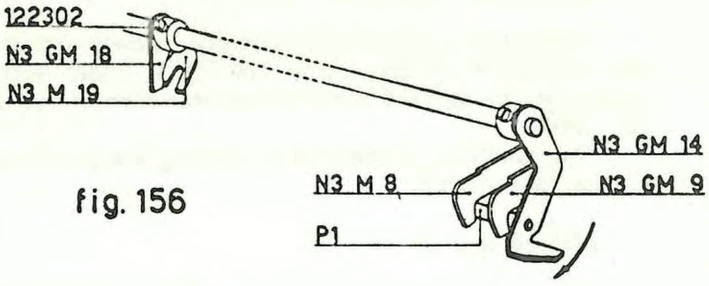


fig. 156

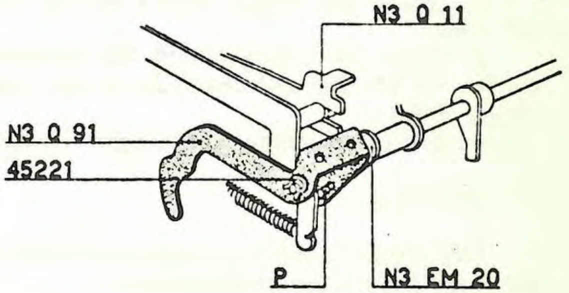


fig. 157

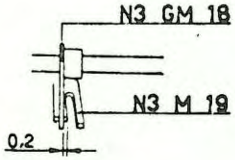


fig. 156a

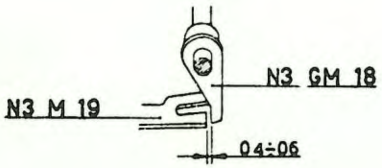


fig. 156b

## 130 - Assembling the non-add control bridge N3 M 21 for zero key.

### MC 14 D - M (Figures 158 - 158a)

*a*) Place the bridge N3 M 21 in position so that the left hole goes onto the left end of the shaft of the N3 EM 20 (figure 158) and the right hole onto the right of the same shaft (figure 158a). Check that the pin **P** end of the zero key N3 EM 6/0 is in the slot of bridge N3 M 21 (figure 158a).

*b*) Secure the bridge with a flexible clip 45361 (figure 158a).

*c*) Hook the spring N3 M 123 between the pin **P** of the N3 EM 6/0 and the hole in the plate N3 GM 3 (figure 158a).

Return the machine to the normal position.

### MC 14 E

The pieces listed in paragraph **130** for **MC 14 D-M** are not used on the Elettrosumma.

## 131 - Adjusting the latch lock pin of the starter rocker.

### MC 14 D - M (Figure 159)

Lower the 5 key of the multiplier slowly and check that the pin **P** of the rocker N3 EM 31 slides without jarring on the inclined plane of the rear stop of the latch N3 GM 9.

The condition is reached by moving the pin **P** along its slot as required.

### MC 14 E

The pieces listed in paragraph **131** for **MC 14 D-M** are not used on the Elettrosumma.

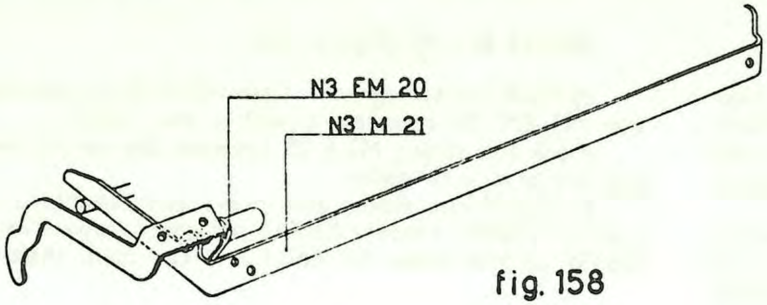


fig. 158

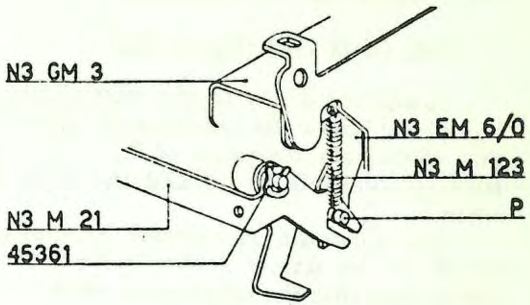


fig. 158a

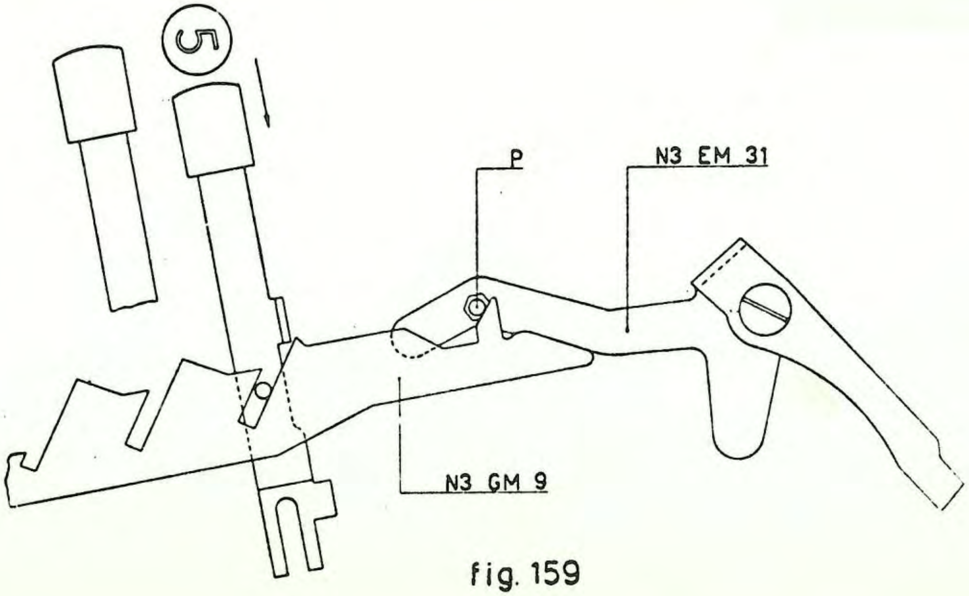


fig. 159

## 132 - Adjusting the starter.

### MC 14 D - M (Figure 160)

Lower the 8 key of the multiplication numbers keyboard and make the machine complete a cycle. Check that there is a clearance of 0.1 ÷ 0.2 mm between the starting lever N3 EV 11 and the hook **G** of the motor wheel.

The condition is reached by moving the eccentric pin $P_1$ of the starter rocker N3 EM 31 as required and taking care that the eccentricity of the pin itself is turned downwards.

### MC 14 E

The pieces listed in paragraph **132** for the **MC 14 D-M** are not used on the Elettrosumma.

## 133 - Assembling the (motor arm) N3 EM 35.

### MC 14 D - M (Figure 161)

*a*) Place the spring holder pin N3 M 29 on the motor arm N3 EM 35, securing it with a nut 138351.

Hook the spring M2 E 28 between the spring holder and the arm with roller.

*b*) Mount the motor arm previously assembled with a screw 125401, a screw 120353 and their respective nuts 138351 on the crank N3 EN 1 and the main shaft.

### MC 14 E

The pieces listed in paragraph 133 for the **MC 14 D-M** are not used on the Elettrosumma.

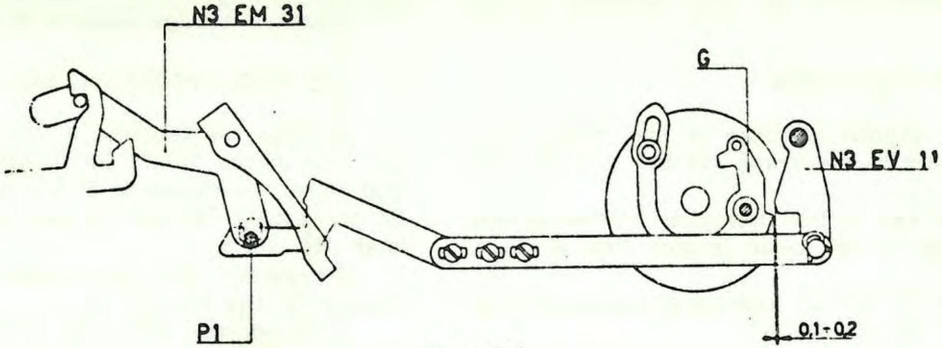


fig. 160

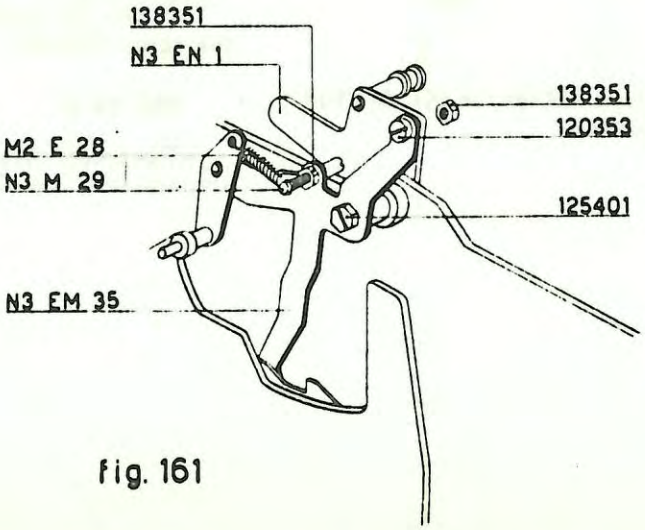


fig. 161

## 134 - Angular adjustment of the (motor arm) N3 EM 35.

### **MC 14 D - M** (Figure 162)

*a*) Adjust the angular position of the motor arm N3 EM 35 in relation to the crank N3 EN 1 in the following way:

— lower the «9» key of the multiplier and make the machine go through a half cycle (motor link at dead centre);

— push the casing N3 GM 23 backwards and turn it to the left (as shown by the arrow);

— check that there is a minimum clearance of 0.5 mm between the pawl N3 M 47 and the first tooth of the rack N3 GM 39;

— at the same time check, turning the zero and one stop N3 M 22 to the left that the latter enters smoothly in the tooth of the release bridge N3 GM 42 without jamming.

### MC 14 E

The pieces listed in paragraph **134** for the **MC 14 D-M** are not used on the Elettrosumma.

## 135 - Adjusting the position of the hook of the subtraction bridge square N3 EM 51.

### **MC 14 D - M** (Figures 163 - 163a)

*a*) Keep the machine in the normal position. Push the arm of the N3 M 55 slightly backwards and check that there is a clearance of 0.2 mm between the hook **G** on the square N3 EM 51 and the square pin **P** of the latch N3 GM 9.

If necessary flex the vertical part of the outer subtraction bridge N3 EM 55.

*b*) Lower the «9» key of the multiplier and make the machine go through a half cycle.

Check that there is a clearance of 0.2 ÷ 0.3 mm between the hook **G** of the square N3 EM 51 (figure 163a) and the square pin **P** of the latch N3 GM 9.

The condition is obtained by moving the shaft N3 M 27 (loosening the screw 120302 and keeping the casing resting on the stop of the 9 lever).

When the adjustment has been made, screw down the screw 120302.

### MC 14 E

The pieces listed in paragraph **135** for the **MC 14 D-M** are not used on the Elettrosumma.

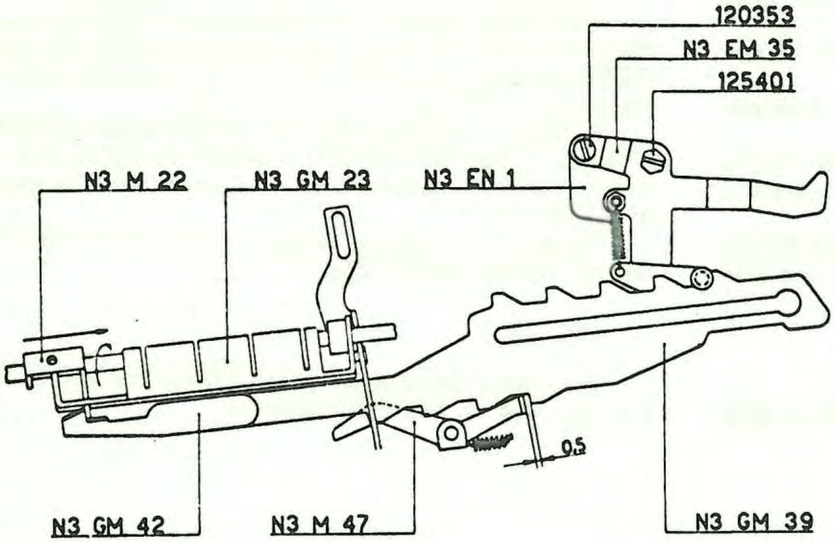


fig. 162

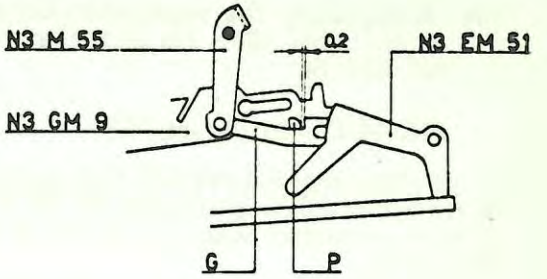


fig. 163

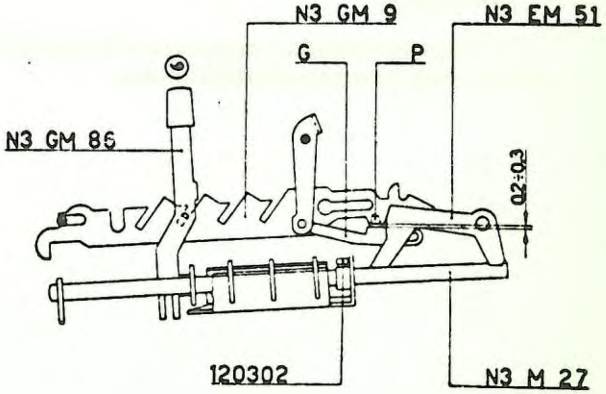


fig. 163a

## 136 - Assembling the multiplication printing sector control N3 GM 72 and the toothed sector N3 GM 74.

### MC 14 D - M (Figure 164)

*a*) Place the arm N3 GM 72 in position on the shaft of the roller carrying arm N3 EM 73 so that:

— it is in contact with the stroke of the shaft of the N3 EM 73;

— its upper pin is inserted in the slot of the multiplication printing slider N3 GM 69.

Clamp the N3 GM 72 to the shaft of the N3 GM 73 with two screws 122302 which should only be partially screwed in.

*b*) Hook the spring N3 M 120 between the N3 GM 72 and the corresponding spring holder attached to the side of the multiplier unit.

### MC 14 E

The pieces listed in paragraph **136** for the **MC 14 D-M** are not used on the Elettrosumma.

## 137 - Adjusting the angular position of the arm N3 GM 72 and assembling the toothed sector N3 GM 74.

### MC 14 D - M (Figure 165)

Keeping the roller **R** of the arm N3 EM 73 in contact with the lower bend of the motor arm N3 EM 35, move the arm N3 GM 72 all the way down; screw in the screws 122302 so that the slider N3 GM 69 does not jam and has a play of 0.2 mm at the maximum.

In these conditions mesh the toothed sector N3 GM 74 with the pinion N3 GM 75, as shown in figure 165; the latter should be in contact with the stroke of the shaft **A** of N3 EM 73.

Clamp the toothed sector to the shaft with two screws 122302 (figure 166).

### MC 14 E

The pieces listed in paragraph **137** for the **MC 14 D-M** are not used on the Elettrosumma.

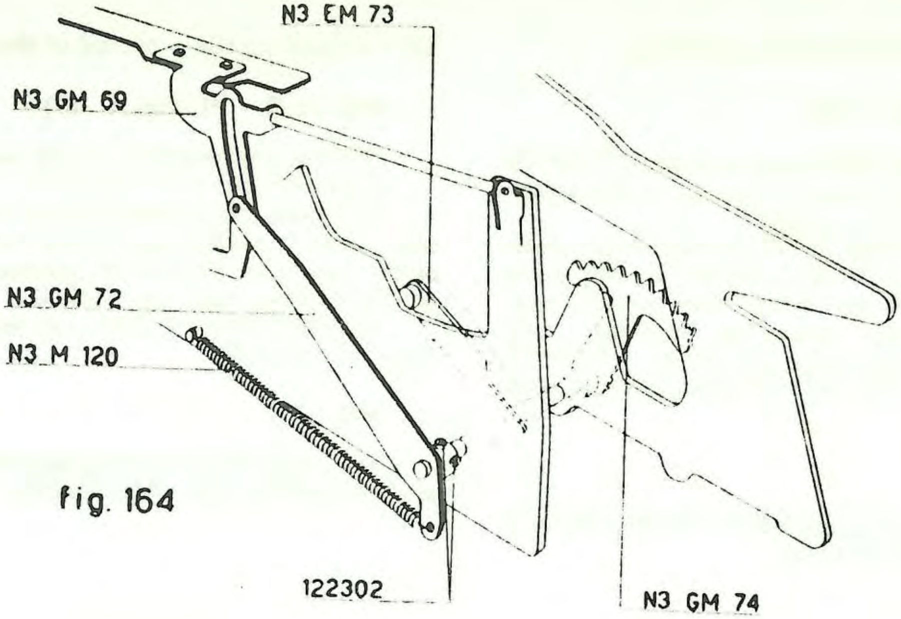


fig. 164

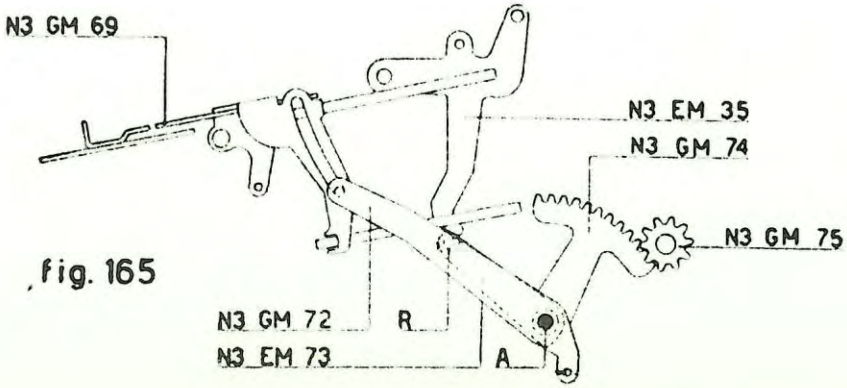


fig. 165

## 138 - Adjusting the multiplication printing.

### MC 14 D - M (Figure 166)

*c*) Loosen the screws 1203014 of the pinion N3 GM 75 which is meshed with the toothed sector; move the sector towards the interior of the machine.

*b*) Press down the 5 key of the multiplier and make the machine accomplish a stroke sufficient for the slider N3 GM 69 to stop on the pin of the stem of the 5 key.

*c*) In these conditions move the multiplier rack N3 EM 278 all the way up; mesh the pinion N3 GM 75 with the toothed sector N3 GM 74 and clamp it with the screws 1203014.

### MC 14 E

The pieces listed in paragraph 138 for the MC 14 D-M are not used on the Elettrosumma.

## 139 - Adjusting the position of the bracket N3 EM 26.

### MC 14 D - M (Figure 167)

*a*) Keep the machine in the normal position.

*b*) Loosen the two nuts **D**.

*c*) Adjust the position of the bracket N3 EM 26 so that there is a clearance of 0.3 mm between the bend of the lock arm N3 GM 14 (pushed slightly to the back of the machine) and the hook **G**.

*d*) When the adjustment has been carried out, screw down the nuts **D**.

### MC 14 E

The pieces listed in paragraph 139 for the MC 14 D-M are not used on the Elettrosumma.

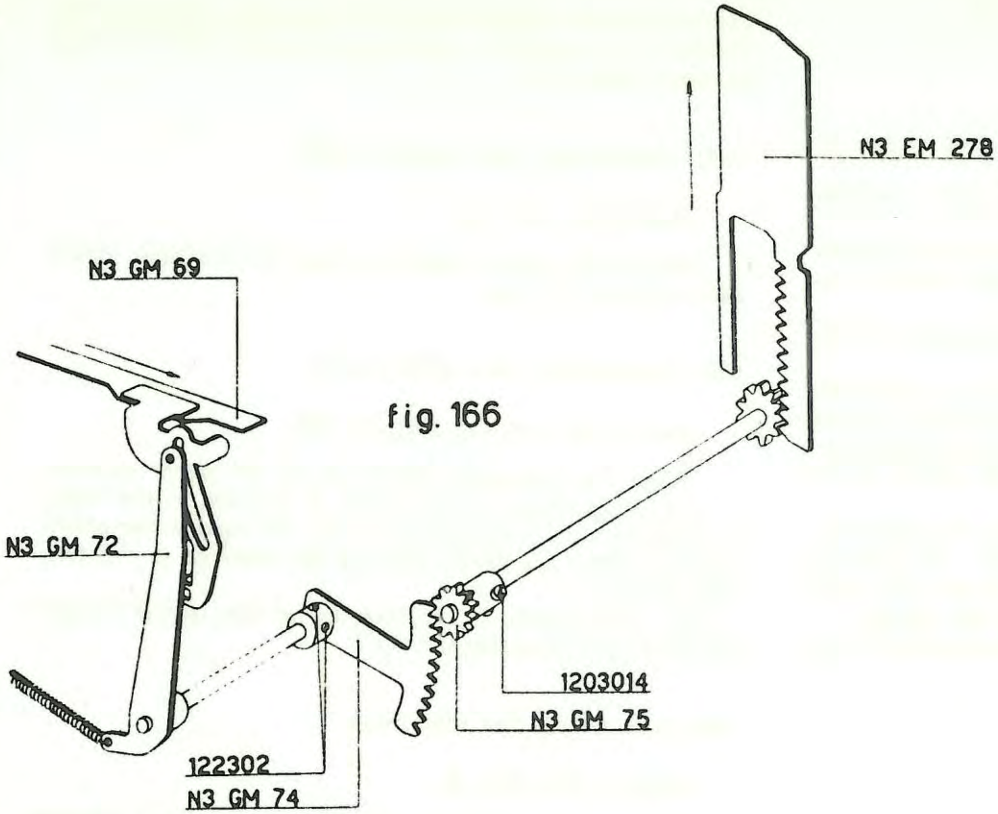


fig. 166

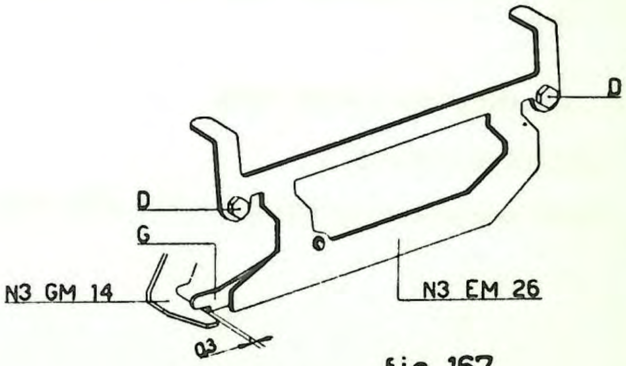


fig. 167

### 140 - Regulating the clutch.

**MC 14 D - M - E** (Figure 168)

*a*) Enter a series of « 0 » so that the slide moves to the extreme left.

*b*) Hold the slide with a spring setting tool, as shown in the figure.

c) Turn on the motor current; lower the addition key and keep it in this position so that the motor continues to turn.

The clutch of the motor wheel should go into action so that the slide cannot be restored.

The clutch is at the right point when an excessive strain is not required to hold the slide and the motor turns with a rhythm very little lower that the regular one.

When the slide is released, it should return to its normal position gently.

These conditions can be reached by increasing or decreasing the braking effect of the clutch. All that has to be done is to screw up or lossen the nut N3 V 45 (see figure 206, assembling and adjusting the units).

**140 bis** - Only for machines with 36° accumulator (see part two).

### 141 - Adjusting the special signs.

**MC 14 D - M - E**

Carry out a series of operations and check that the special signs are aligned with the calculation figures. The condition is reached by moving the bracket N3 O 5 along its slot (figure 65).

### *142 - Adjusting the motor speed.

**MC 14 D - M - E**

Adjust the motor speed so that the machine makes 140 strokes a minute.

### 143 - Assembling the dust cover.

**MC 14 D - M - E** (Figure 169)

Place the dust cover N3 W 22 on the motor so that:
— the upper brush of the motor is inserted in the hole;
— the screws **V** which project from the square bar which connects the sides of the carriage are inserted in the two rear slots;
— the two shanks **A** are inserted in the lateral flanges of the motor (see the arrow).

### 144 - Removing the iron feet.

**MC 14 D - M - E**

Unscrew the iron feet UA 8202 (figure 1) and remove their washers 40362.

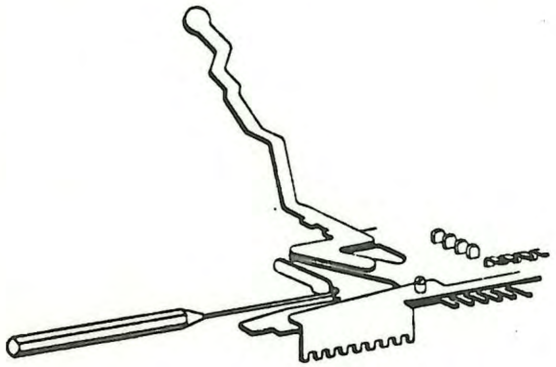


fig. 168

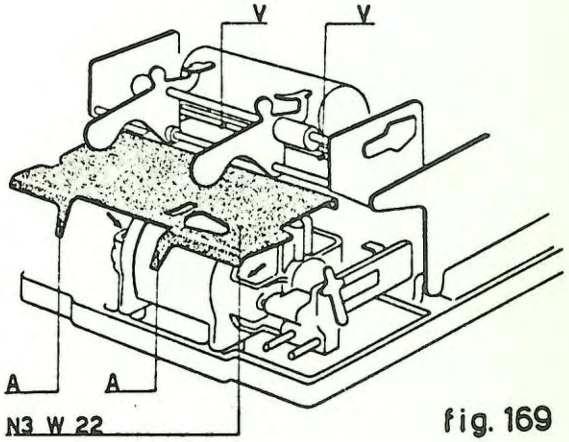


fig. 169

## 145 - Assembling the base plate.

### MC 14 D - M (Figure 170)

*a*) Place the gaskets for the cover suspensions N3 W 5 in position on the shanks of the leaf spring N3 GA 16.

*b*) Attach the multiplier base plate N3 M 103 to the base of the machine with three screws 120352.

*c*) In the four holes of the base plate N3 M 101 place as many bushings N3 A 20.

Clamp the plate to the base with four studs 1263539.

*d*) Put the distance pieces for the cover N3 A 22 in the holes of the two lateral shanks of the plate N3 M 103. Two more of the same distance pieces go into the lateral holes on the left of the base.

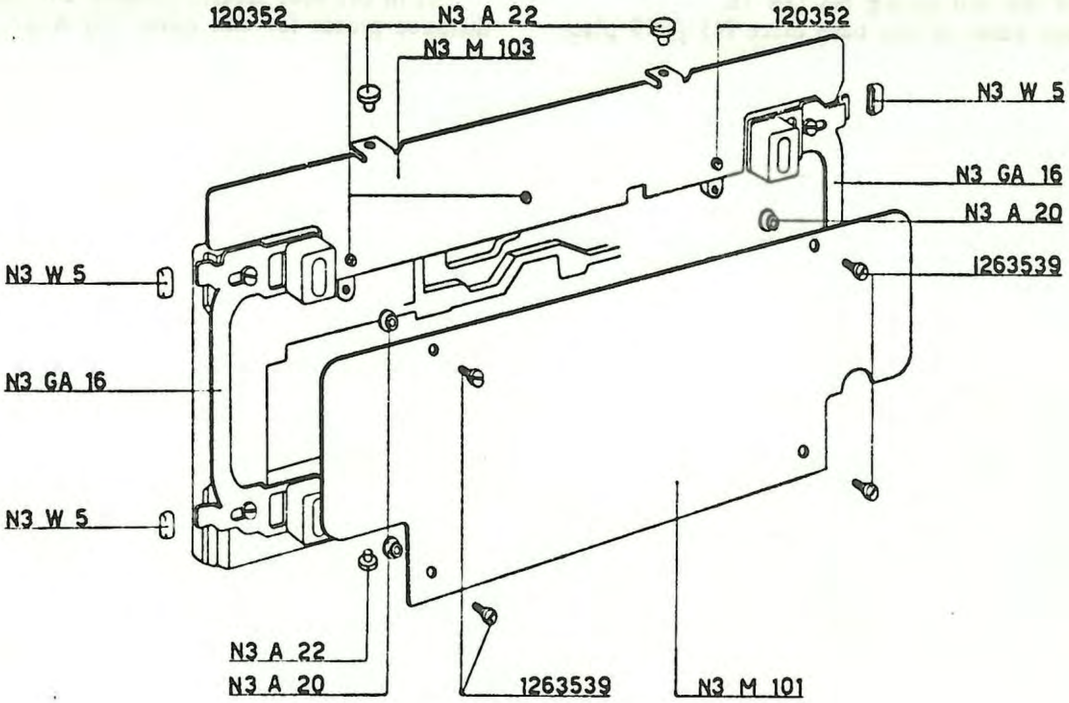

120352
N3 A 22
N3 M 103
120352
N3 W 5
N3 GA 16
N3 A 20
1263539
N3 W 5
N3 GA 16
N3 W 5
N3 A 22
N3 A 20
1263539
N3 M 101

fig. 170

**MC 14 E (Figure 171)**

*a*) Place the gaskets for the cover suspension N3 W 5 on the shanks of the leaf spring N3 GA 16.

*b*) In the four holes of the base plate N3 A 19 place as many bushings N3 A 20.

Clamp the plate to the base of the machine with four studs 1263539.

*c*) In the four lateral holes of the base, place as many distance pieces for the cover N3 A 22.

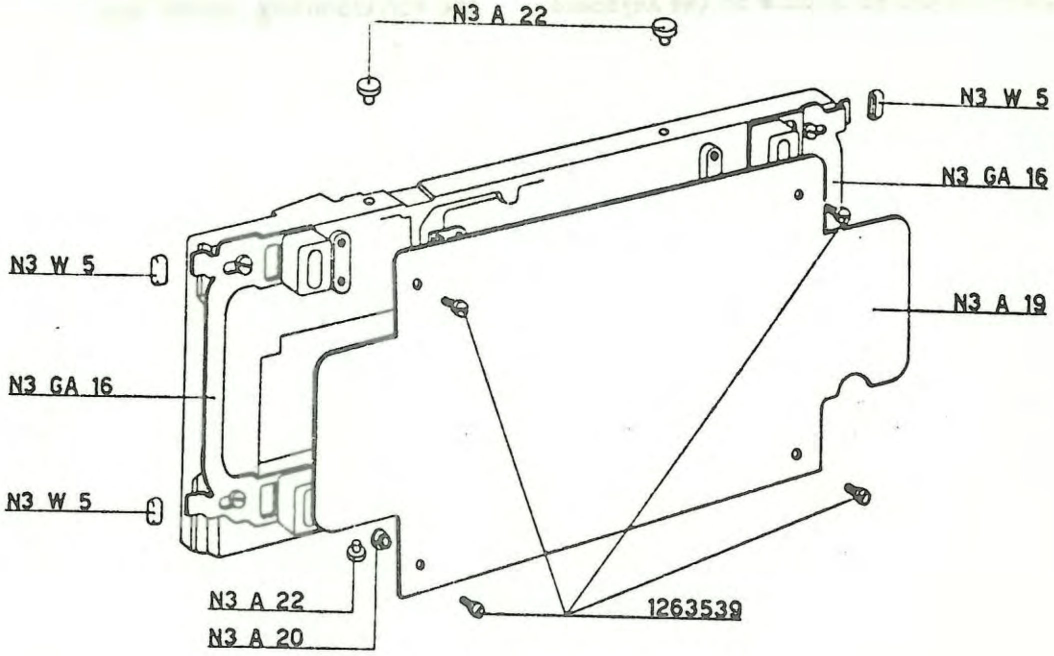

N3 A 22
N3 W 5
N3 GA 16
N3 W 5
N3 A 19
N3 GA 16
N3 W 5
N3 A 22
N3 A 20
1263539

fig. 171

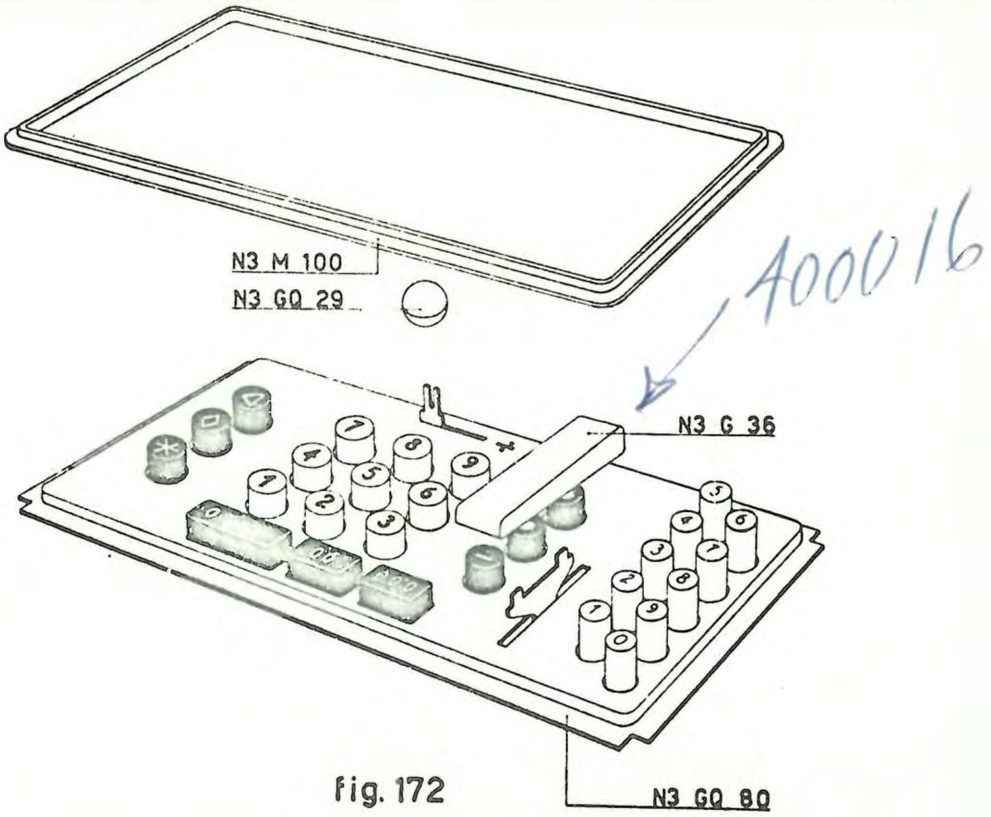
## 146 - Assembling the keyboard panel.

**MC 14 D** (Figure 172)

*a*) Put the panel N3 GQ 80 in place on the keyboard. Lodge the strip N3 M 100 on the egde of the panel.

*b*) Put the addition key cap N3 G 36 in place on the corresponding control key.

*c*) Put the division key cap N3 GQ 29 in place on the corresponding control key.



400016

fig. 172

**MC 14 M** (Figure 173)

*a*) Put the panel N3 GM 104 in place on the keyboard. Place the strip N3 M 100 in position on the panel.

*b*) Place the addition key cap N3 G 36 in position on the corresponding control key.

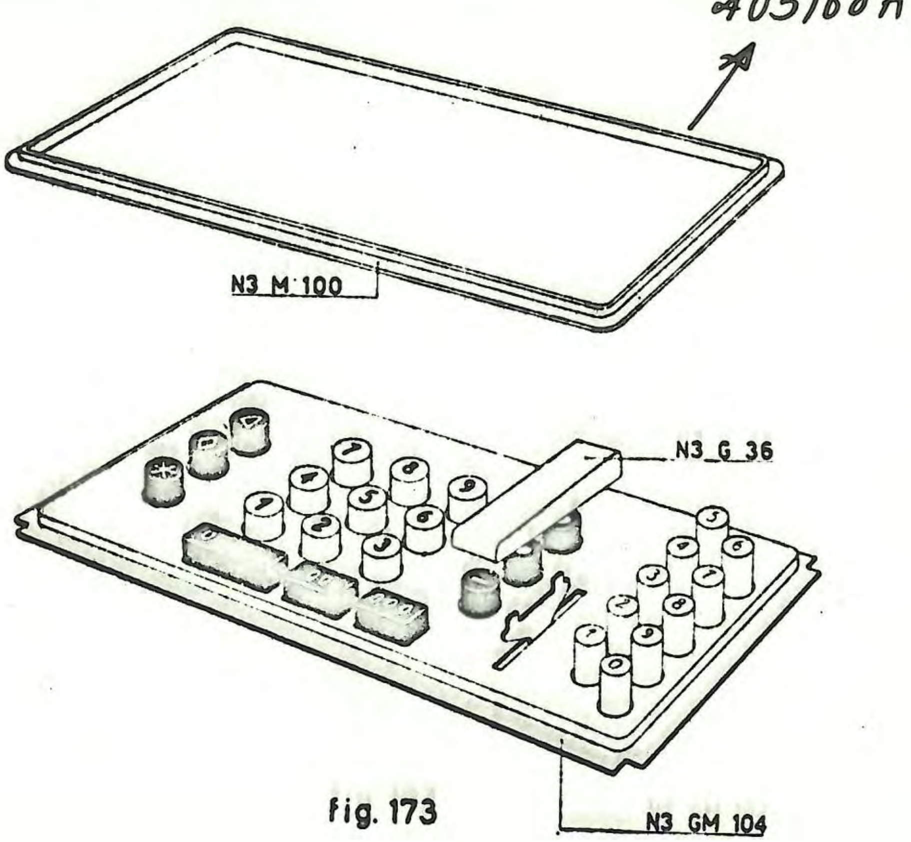


fig. 173

**MC 14 E** (Figure 174)

Put the panel N3 GW 3 in place on the keyboard.

Lodge the strip N3 W 4 on the panel.

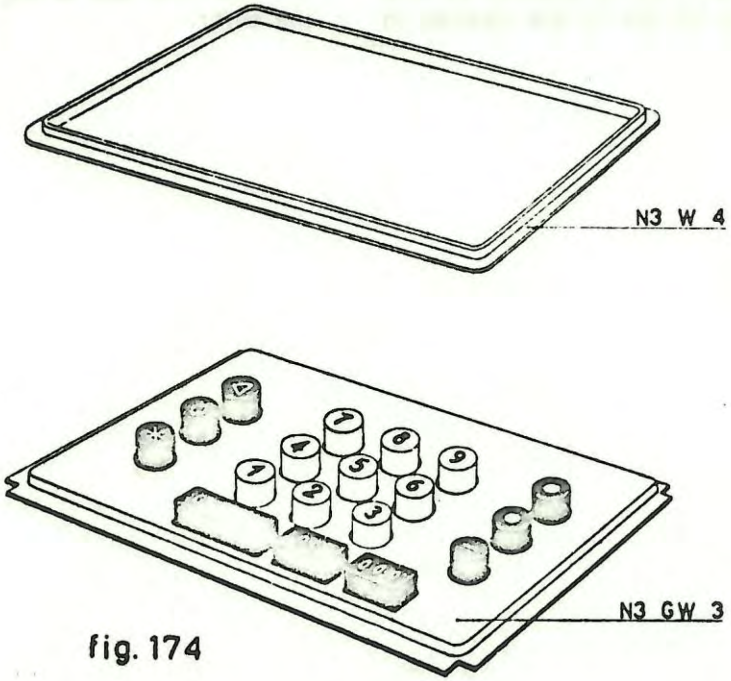


fig. 174

### 147 - Assembling the cover.

**MC 14 D - M** (Figure 175)

*a*) Place the cover N3 AM 105 in position so that the shanks of the leaf spring N3 GA 16 are inserted in the seats made in the cover itself. Clamp the leaf spring to the base.

*b*) Lodge the hand knob N3 GU 23 on the platen shaft and secure it with two screws 120302.

The inner face of the hand knob should barely touch the cover.

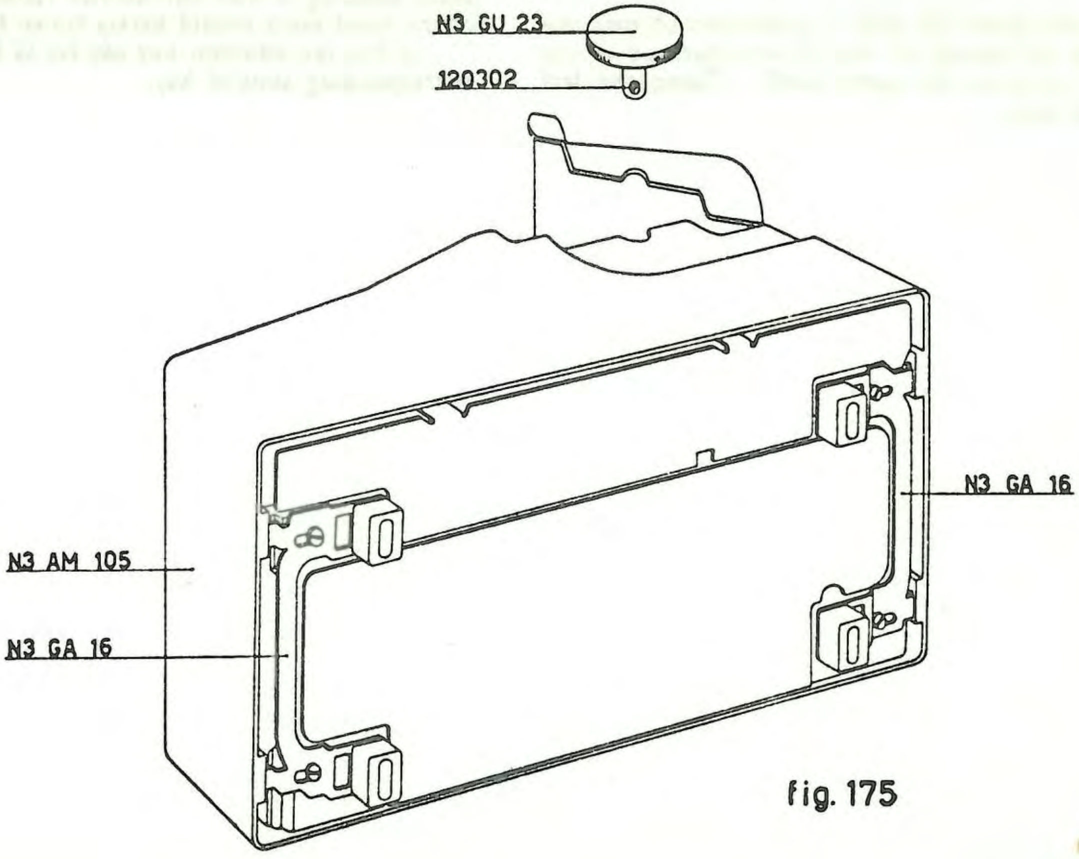


fig. 175

**MC 14 E** (Figure 176)

*a*) Place the cover N3 AW 1 in position so that the shanks of the leaf spring N3 GA 16 are inserted in the proper seats made in the cover itself. Clamp the leaf spring to the base.

*b*) Lodge the hand knob N3 GU 23 on the platen shaft, securing it with two screws 120302. The inner face of the hand knob should barely touch the cover.

*c*) Put the addition key cap N3 G 36 in place on the corresponding control key.

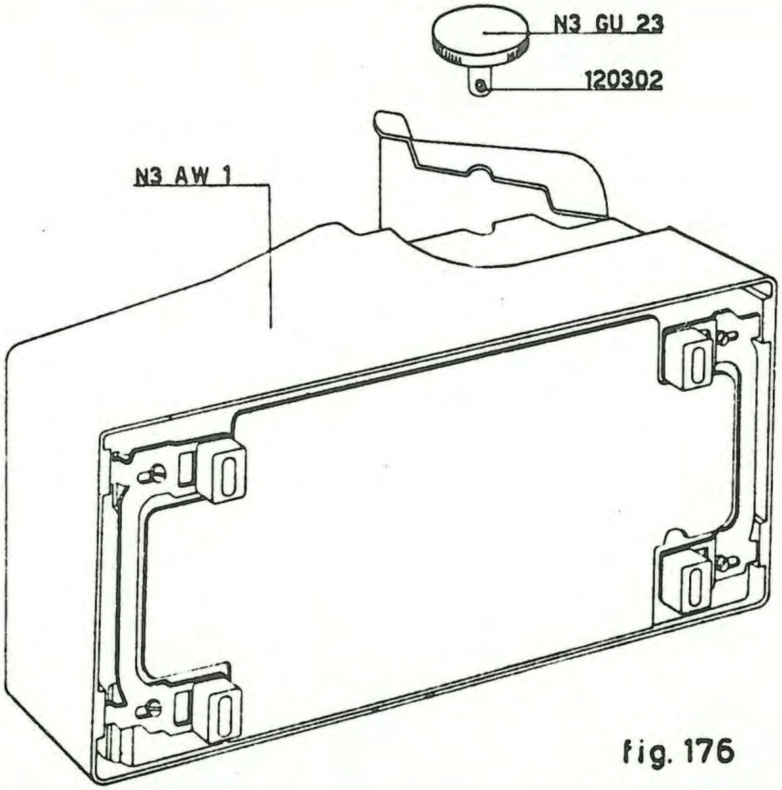


fig. 176

# Instructions for Assembling and Adjusting the units

## MC 14 D - M - E (180° accumulator)

## Preparing the carriage unit.

### MC 14 D - M

*a*) Figure 177

Place the platen carrying plate N3 U 16 in position on the side of the carriage N3 GU 1 S, securing it with two screws 120354 which should only be partially screwed in.

Place the platen carrying plate N3 U 16 in position on the side of the carriage N3 GU 1 D, securing it with two screws 120351 which should only be partially screwed in.

*b*) Figure 177

Mount the paper holder roller N3 U 30 on the paper guide plate N3 GU 11, flexing one of the arms of the latter slightly. Bring the axial play of the roller to the minimum compatible with its perfect freedom of rotation; this is accomplished by a moderate flexion of the same arms.

*c*) Figure 177

On the shaft N3 U 6 place in order:

— the paper holder control hook N3 GU 8 with its screw 122302;

— the collar 142461 with its screw 120262;

— the paper guide plate with roller (prepared according to paragraph *b*) astride the paper release lever N3 GU 7 with its screw 122302.

*d*) Figure 177

Connect the two sides N3 GU 1 S and N3 GU 1 D with the square bar N3 U 4 which should be secured with two screws 120352. Lodge the tapered ends of the shaft N3 U 6 (prepared according to paragraph *c*) in the proper rear openings of the two sides.

Screw down the two screws 120352.

Place the type rack guide plate N3 U 5 in position on the square bar N3 U 4 with two screws 1253029 which should only be partially screwed down.

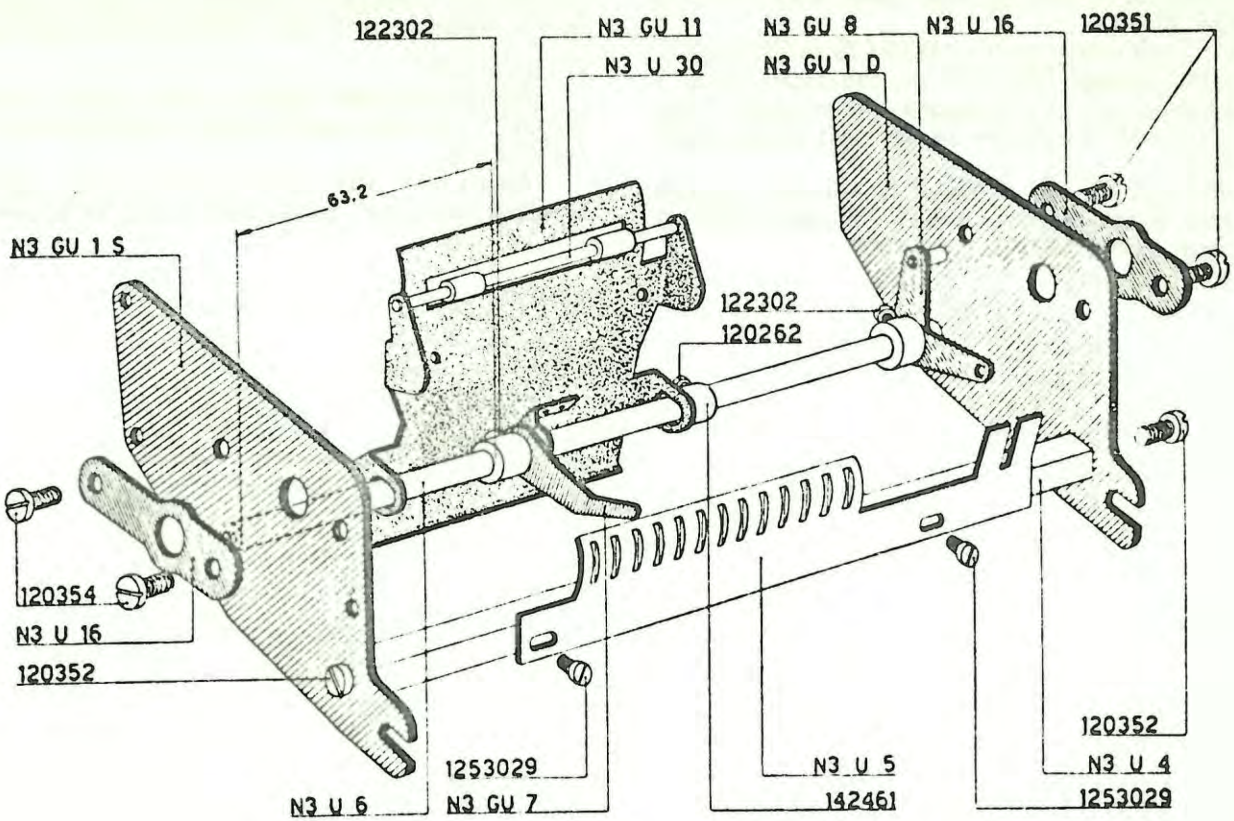

122302
N3 GU 11
N3 U 30
N3 GU 8
N3 GU 1 D
N3 U 16
120351
63.2
N3 GU 1 S
122302
120262
120354
N3 U 16
120352
120352
1253029
N3 U 5
N3 U 4
N3 U 6
N3 GU 7
142461
1253029

fig. 177

e) Figure 178

Lodge a collar 142632 on the lower shaft N3 U 3 with a screw 125262.

Lodge the roll carrying arms N3 GU 28 and N3 GU 27 with their leaf springs N4 U 31 on the shaft N3 U 3 mentioned before and on the second similar shaft. Place the spring N4 U 19 in position on the right of the upper shaft N3 U 3.

The unit thus formed is placed in position between the two sides of the carriage; secure the two shafts N3 U 3 with four screws 120352.

Adjust the axial position of the roll carrying arm N3 GU 27. The collar 142632 on which it rests should be 98 mm away from the left side of the carriage.

f) Figure 177

Adjust the axial position of the paper release lever N3 GU 7; its hub should be 63.2 mm away from the side N3 GU 1 S.

Adjust the axial position of the collar 142461 so as to allow the paper guide plate a play of 0.1 mm.

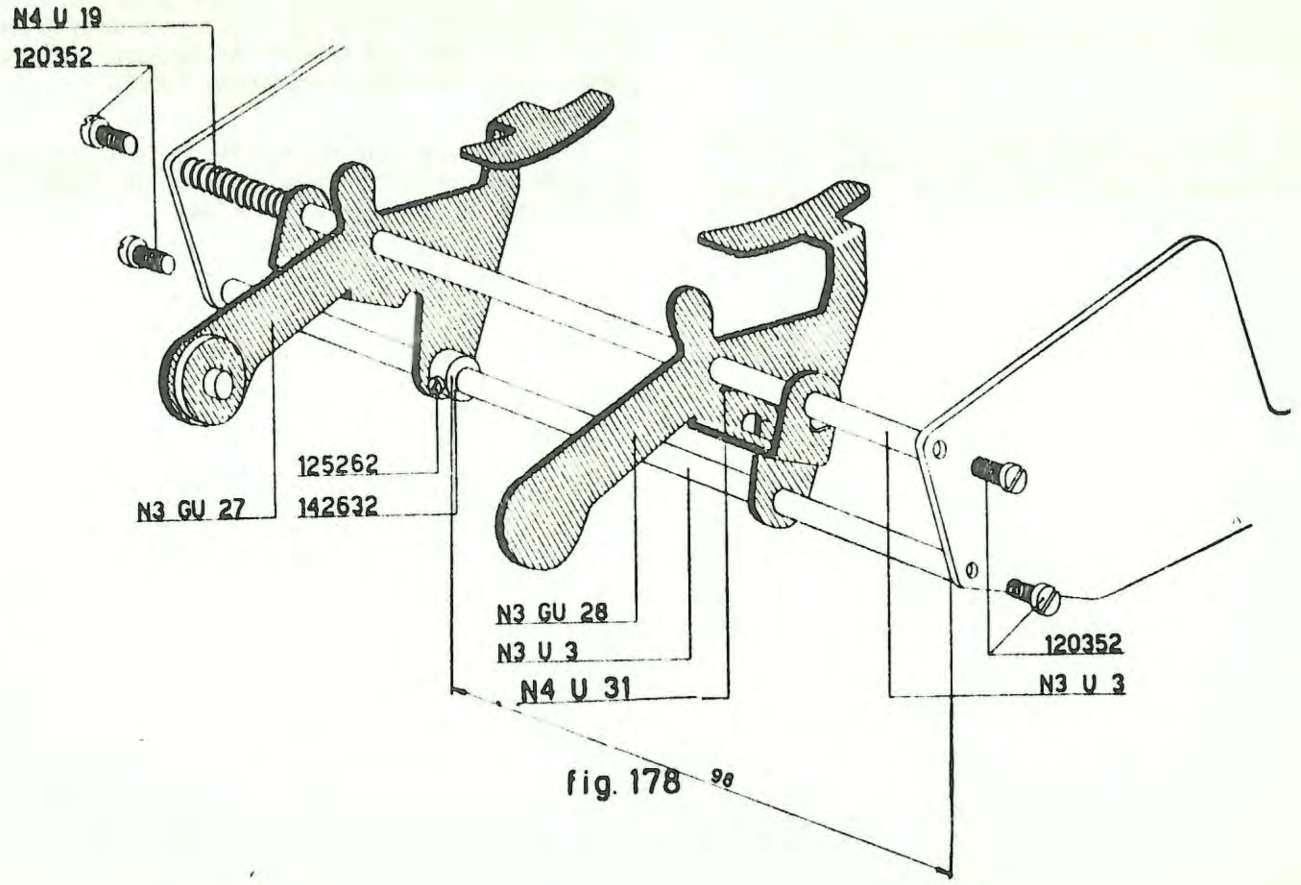

N4 U 19
120352
N3 GU 27
125262
142632
N3 GU 28
N3 U 3
N4 U 31
120352
N3 U 3
98

fig. 178

*g*) Figure 179

Introduce the platen shaft N3 M 138 into the guide openings of the two sides. Adjust the position of the two lateral plates N3 U 16 so that the shaft is completely free to rotate.

Screw down the screws 120354 and 120351 of the two plates N3 U 16.

*h*) Figure 179

Clamp the line spacing wheel N3 U 22 onto the platen N3 GU 18 with three screws 1252610.

Place the platen and its shaft N3 M 138 in position. Secure the latter with the plate N3 U 32 which is clamped with two nuts 138351.

*i*) Figure 179

Adjust the axial position of the platen so that the line spacing wheel N3 U 22 is 21.6 mm away from the inner face of the right side of the carriage. Secure the platen to its shaft with two screws 120302.

*l*) Figure 179

Place the eccentric column N3 U 14 in position on the right side of the carriage with its nut 138351 which should only be partially screwed on.

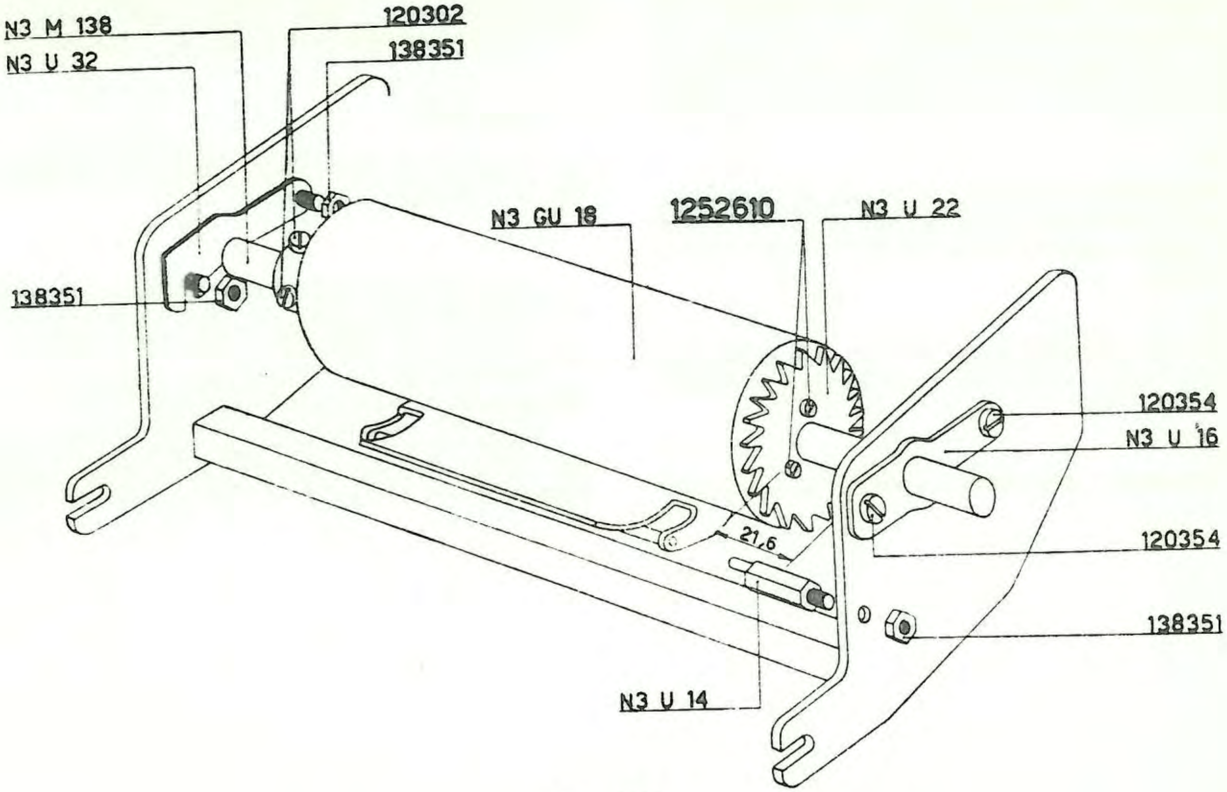

N3 M 138
120302
138351
N3 U 32
138351
N3 GU 18
1252610
N3 U 22
120354
N3 U 16
120354
21,6
138351
N3 U 14

fig. 179

*m*) Figure 180

Assemble the paper holder control lever N3 U 9 and a washer 40365 on the column N3 U 10. Place the unit thus formed on the right side of the carriage and secure the column with a nut 138351.

Lodge the line spacing roller holding lever N3 EU 25 on the same column N3 U 10 securing it with a flexible clip 45281.

*n*) Figure 181

Adjust the position of the paper holder control hook N3 GU 8 axially so that its pin covers the entire thickness of the paper holder control lever N3 U 9. Screw down the screw 122302.

*o*) Figure 182

Hook the spring N3 U 33 between the line spacing roller carrying lever N3 EU 25 and the paper holder control hook N3 GU 8.

*p*) Figure 183

Place a distancer 1 mm thick between the lower end of the paper holder control roller carrying lever N3 U 9 and the shaft N3 U 3.

In these conditions bring the point of the lever N3 GU 7 into contact with the paper guide plate N3 GU 11.

Screw down the screw 122302. Take out the distancer.

## MC 14 E

In place of the platen shaft N3 M 138, the shaft N3 U 2 should be used.

N. B. - As has been seen from the description of the assembling of the carriage units, there are two types of shaft for the platen.

However, the hand knob is the same for the carriage on all three machines D - M - E.

The shaft for the Elettrosumma is shorter as the body of this machine is smaller than the others.

The shaft coupling of the platen-knob used to be different.

There was only a single shaft (N3 U 2) and two knobs (N3 GU 23) for Elettrosumma - N3 GM 108 for Multisumma and Divisumma. The knob N3 GM 108 had a longer hub.

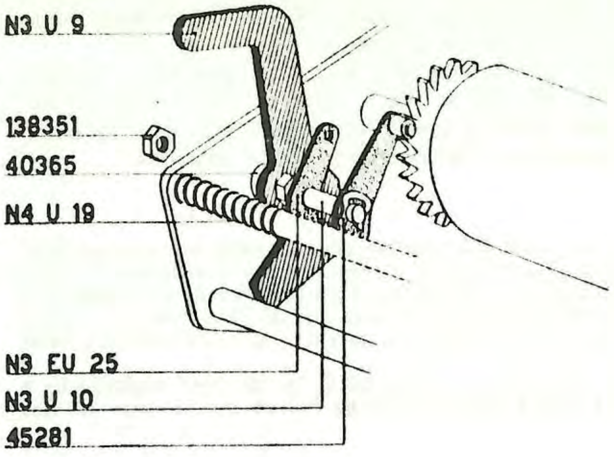


fig. 180

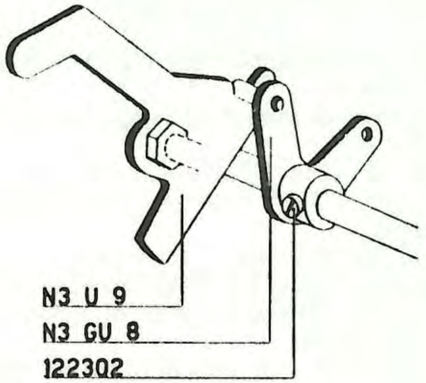


fig. 181

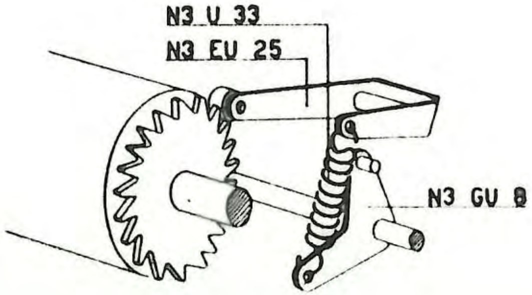


fig. 182

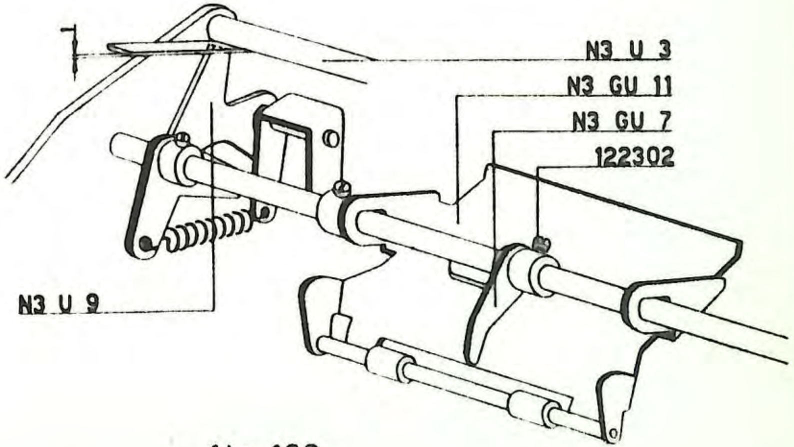


fig. 183

## Preparing the horizontal racks.

### MC 14 D - M - E (Figure 184)

*a*) Place the horizontal rack N3 D 3 in position on the counter rack **C**.

The two slots **A** should be lodged on the respective guide pins **P**.

*b*) Lodge the stop N3 D 14 in the two holes **F** of the counter rack. Push it all the way in and bend the two ends inwards.

*c*) Check that the rack slides freely.

*d*) Hook the spring N3 D 15 between the rack and the counter rack. The same type of spring is used for all the first ten racks.

On the eleventh rack (the first on the left) a spring N3 D 21 which is stronger than the N3 D 15 should be hooked. The last rack also controls the negative balance unit.

N. B. - From the machines with serial number 436951/E, 915901/D, the springs N3 D 15 are been substituted with N3 D 21 springs.

On the Divisumma, the first horizontal rack on the right is the N3 EQ 4. It is different from the regular ones in that it has a special pin which was mentioned in the description of the assembly of the machine.

**N. B. - The N3 D 3 and the counter racks are coupled after a straightening out process. They are never supplied separate but always coupled. If for any reason it is necessary to dismount the rack of the corresponding counter rack they must be marked so that the correct coupling is carried out when they are reassembled.**

**N. B. - Recently the stop N3 D 14 has been replaced by a bushing N3 D 114 which should be rivited on the same counter rack.**

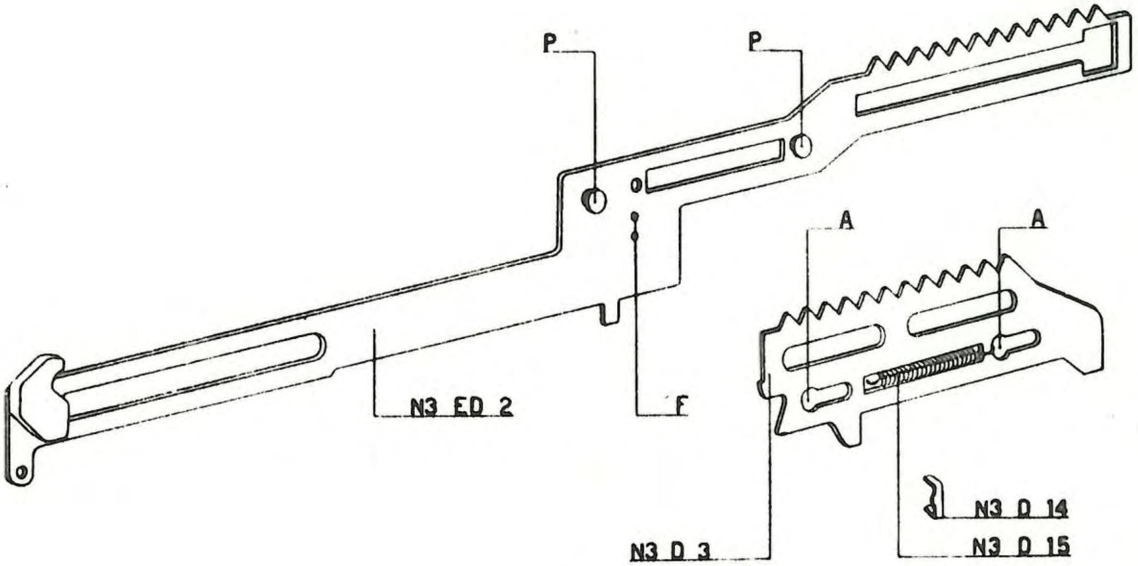


fig. 184

## Preparing the type racks.

### MC 14 D - M - E

We describe the assembling of a regular rack. The preparation of the multiplication, division and special signs racks is carried out in the same way. (Figures 185 - 186 - 187 - 188 show respectively a regular rack, the one for multiplication, the one for division and the one for the special signs).

Bear in mind that the eleventh regular rack does not bear the sign 0.

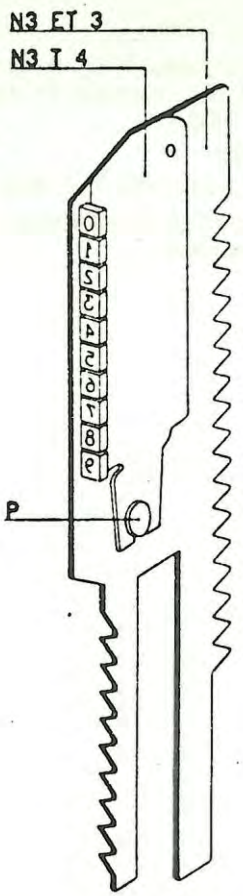


fig. 185

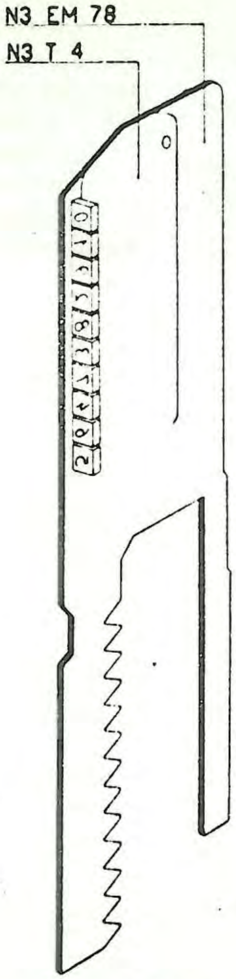


fig. 186

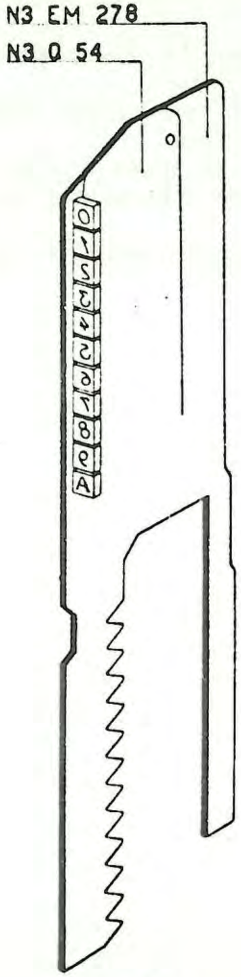


fig. 187

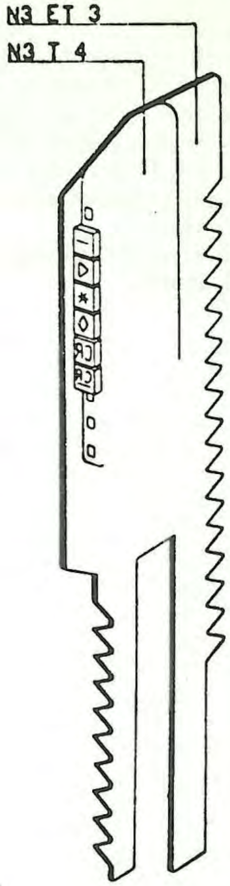


fig. 188

*a*) Figure 189

Ease the type carrying frame N3 T 4 down on the work surface as shown in the figure.

Place the series of type in their proper order and direction in the guides of the frame.

Place the first spring N3 T 49; insert it in the frame using a spring pincer and secure it by putting the plate N3 ET 3 above it.

Place a second spring in position and slide the plate N3 ET 3 ahead.

Continue in order.

*b*) When the assembling is completed the pin **P** of the rod should be inserted in the slot of the frame N3 T 4 (figure 185).

c) Figure 189

Secure the frame N3 T 4 with a screw 125265.

*d*) Check that the individual type characters have freedom of movement.

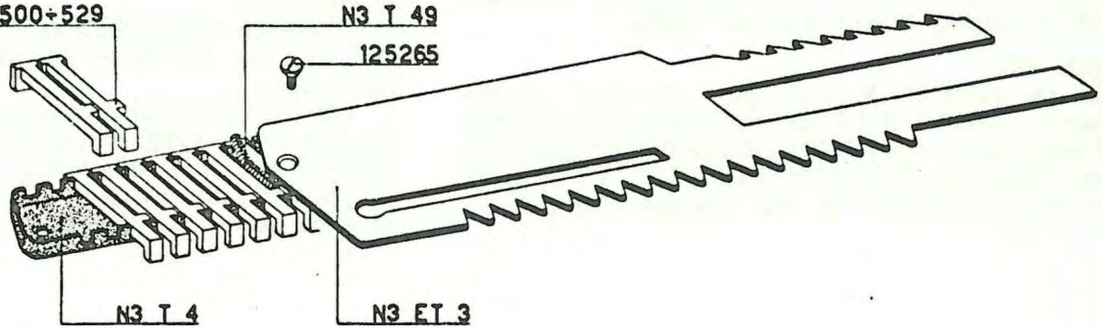


fig. 189

## Preparing the multiplier unit.

### MC 14 D - M

*a*) Figure 190

In the selector housing N3 M 13 lodge 12 washers N3 M 12.

Lodge the housing on the panel N3 GM 1, securing it with three screws 125306.

*b*) Figure 190

Place the plate N3 M 60 in position on the panel N3 GM 1 securing it with a screw 120302.

c) Figure 191

On the guide pin **P** of the panel N3 GM 1 put the subtraction latch N3 GM 9 and the addition one N3 M 8.

Then place a stem N3 GM 6/0 (for 0 key) in position and four stems N3 GM 6/6 (for keys 6 - 7 - 8 - 9) which should be guided below by the corresponding pins $P_1$.

On the opposite side, i.e. in coincidence with the latch N3 M 8, place five stems N3 GM 5 (for keys 1 - 2 - 3 - 4 - 5) in position.

*d*) Figure 191

Place the support for the locking shaft N3 M 2 in position on the panel N3 GM 1, securing it with a screw 120302.

Check that pin **A** of stem N3 GM 6/0 slides on the front horizontal face of the N3 M 2.

e) Figure 192

Place the keyboard plate N3 GM 3 in position making sure that the ten stems are lodged in their respective guide slots.

Secure the N3 GM 3 with two special screws N3 M 4 (placing collars 40306 in between) and their nuts 138305 which should only be partially screwed on.

Between the ten stems and the plate N3 GM 3 hook as many springs N3 M 123.

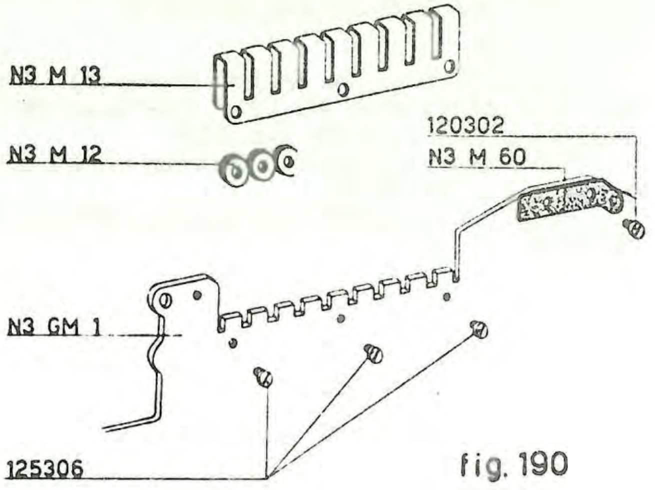


fig. 190

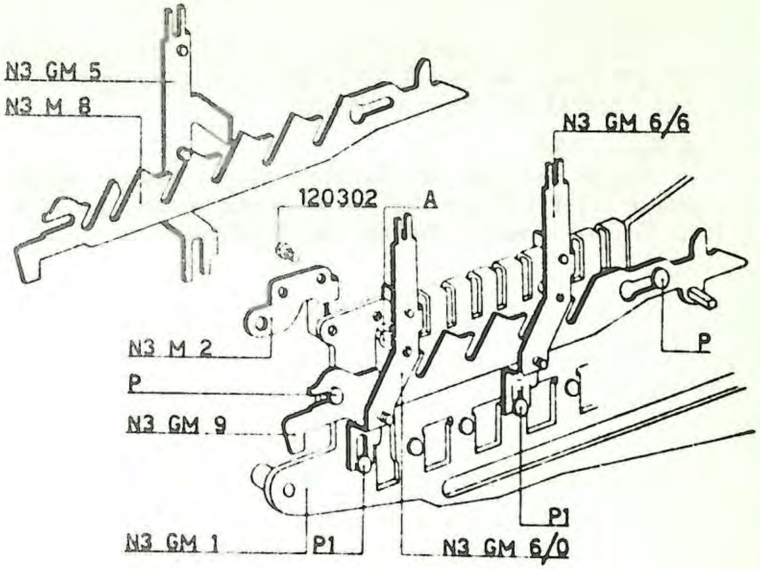


fig. 191

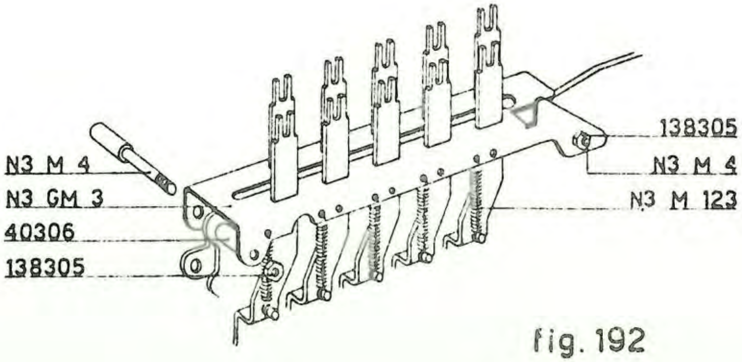


fig. 192

*f*) Figure 193

Assemble the current hook N3 M 61 on the panel N3 GM 1 with washer 40304 in between, securing it with stud 1263033 and its nut 138305.

*g*) Figure 194

Lodge the hub of the substraction bridge release square N3 EM 51 on the pin **A** of the panel N3 GM 1.

Secure it with a flexible clip 45281.

The hook **G** of the N3 EM 51 should be in front fo the square pin **Q** of the latch N3 GM 9.

*h*) Figure 195

Lodge the rocker for addition strokes N3 EM 57 on the pin **P** of the panel N3 GM 1 (see figure 194 also), securing it with a flexible clip 45281.

Hook the spring N3 G 51 between the pieces comprised in the N3 EM 57.

Hook the spring N3 T 45 between N3 EM 57 and N3 M 61.

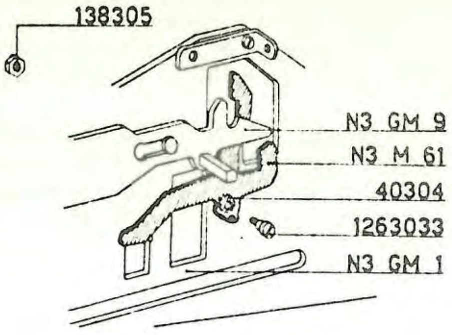


fig. 193

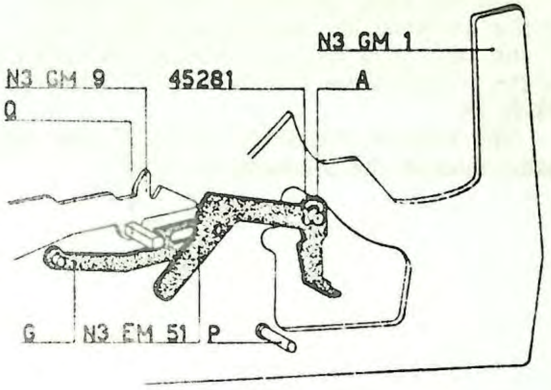


fig. 194

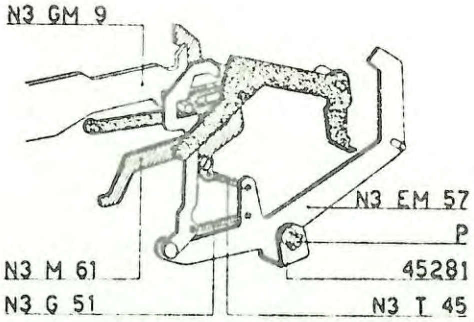


fig. 195

*i*) Figure 196

On the shaft N3 M 27 lodge in order:

- the universal bar control arm N3 M 25;
- the zero stop for the universal bar N3 M 22;
- the universal bar case N3 GM 23 with the four stops N3 M 24.

The ends of the shaft N3 M 27 are lodged in the guide holes in the brackets N3 M 28.

Place the unit so formed in position on the panel N3 GM 1 as shown in the figure.

Secure the brackets N3 M 28 with two screws 120302. Check that the shaft N3 M 27 is perfectly free to slide and rotate.

Hook four springs N3 M 126 between the N3 M 22 and the first three stops N3 M 24 and the keyboard plate N3 GM 3. Hook a spring N3 M 121 from the latter to the rear arm of the housing N3 GM 23.

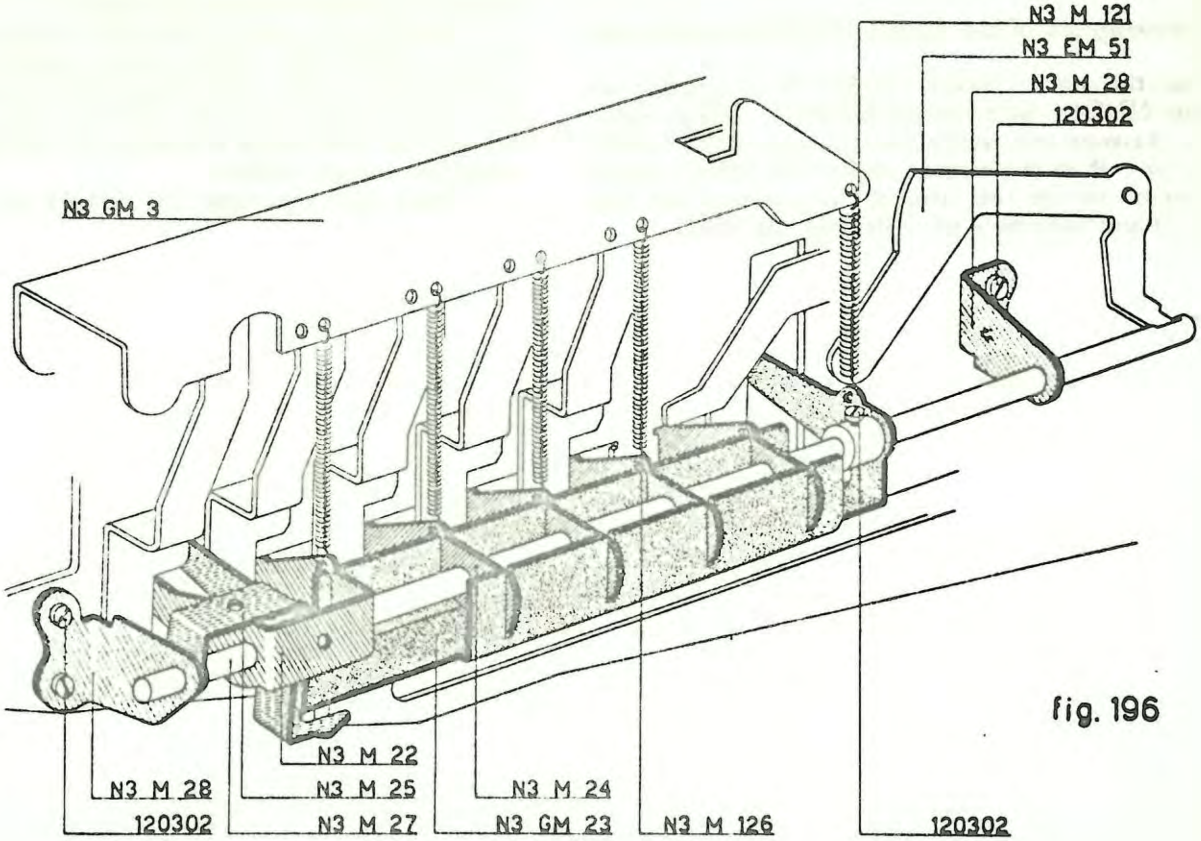

N3 M 121
N3 EM 51
N3 M 28
120302
N3 GM 3
N3 M 22
N3 M 28
N3 M 25
N3 M 24
120302
N3 M 27
N3 GM 23
N3 M 126
120302

fig. 196

*l*) Figure 197

On the starter rocker N3 EM 31 assemble:

— the eccentric of the starter N3 M 33 with its nut 138305;

— the hooking pin of the latches N3 M 34 with its nut 138305.

Place the starter rocker N3 EM 31 in position on the panel N3 GM 1 with the pin N3 M 32. Place a collar 40416 in between and secure the pin with a nut 138407.

The part **P** of the starter rocker N3 EM 31 should be connected to the rear arm of the universal bar case N3 GM 23 and secured with a flexible clip 45221.

*m*) Figure 198

Place the multiplication printing slider N3 GM 69 in position so that its front pin **R** is inserted in the guide slot of the keyboard plate N3 GM 3.

Introduce the guide shafts N3 M 62 into the slots of the N3 GM 69, lodging their tapered parts in the corresponding holes in the brackets N3 M 60 and N3 M 28. At the rear the two shafts N3 M 62 are guided by the bracket N3 M 70 which is clamped on the panel N3 GM 1 with two screws 120302.

Check that the slider N3 GM 69 can move freely.

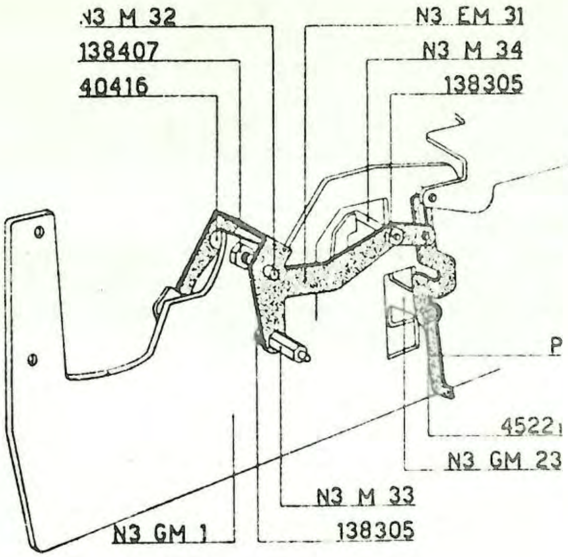


fig. 197

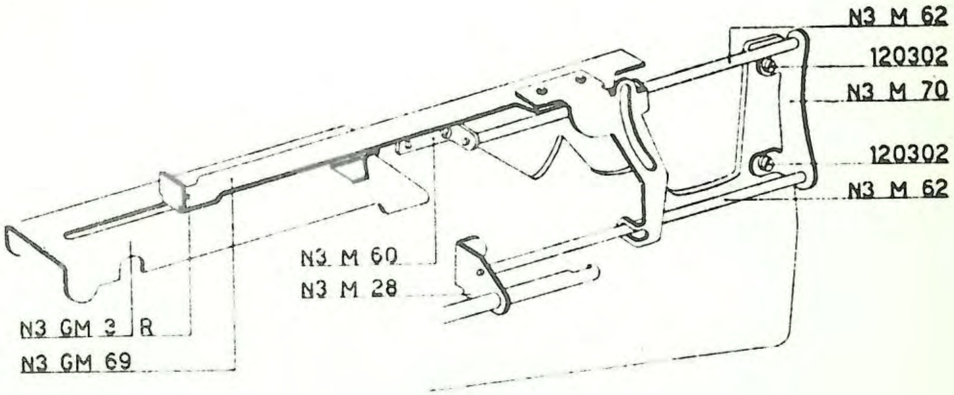


fig. 198

*n*) Figure 199

Mount the rack N3 GM 39 which, at the rear, is guided by the pin **S**. In front the rack N3 GM 39 is guided by the release bridge N3 GM 42. Secure the latter to the rack with two nuts 138306.

Lodge the pawl N3 M 47 on the proper pin on the panel N3 GM 1 securing it with a flexible clip 45281.

Hook the spring N3 M 122 between the rack N3 GM 39 and the spring holder **H**.

Hook the spring N3 T 46 from the pawl N3 M 47 to the spring holder $\mathbf{H}_1$.

*o*) Figure 200

Unscrew the two nuts 138305 and place the bracket N3 EM 26 in position on their pins.

The lever **L** of the latter should be in the position shown in the figure in relation to the zero stop N3 M 22.

Screw on the two nuts 138305 again partially.

Hook the spring N3 T 46 between the lever **L** and its bracket N3 EM 26.

*p*) Figure 201

Lodge the outside part of the subtraction bridge N3 M 55 on the guide pin **P** of the plate N3 GM 3; below it is connected to the hook of the bracket N3 EM 51. Secure it with a flexible clip 45221.

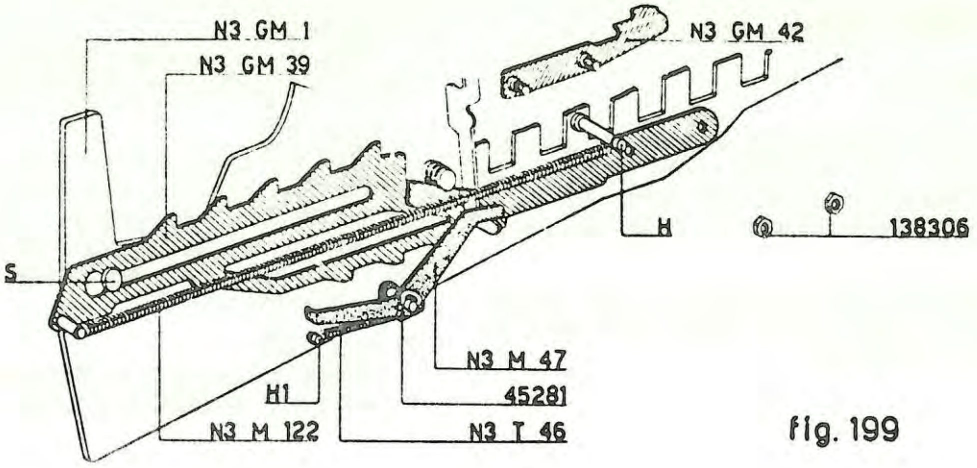


fig. 199

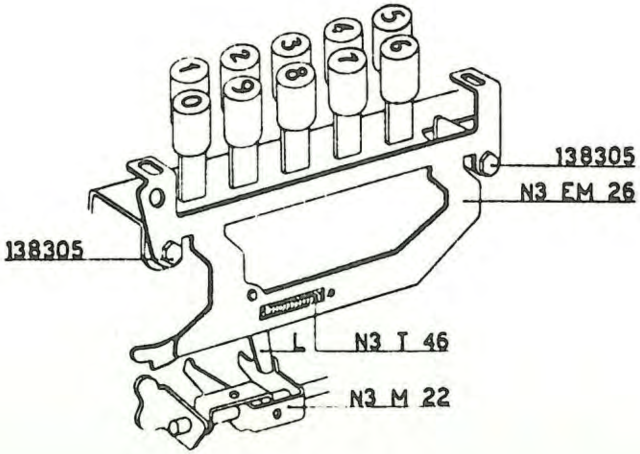


fig. 200

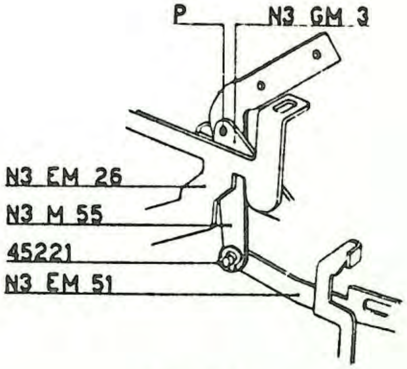


fig. 201

## Preparing the ribbon cholding unit.

### MC.14 D - M - E

N.B — We only describe the assembly of the left ribbon holding unit. The assembly of the right one is identical with a single exception; the crank N3 EL 3 (figure 204) does not have the arm carrying the pin **P**.

*a*) Figure 202
Place the roller PL 132 in position on the ribbon reverse lever N3 GL 108 with the special stud N3 L 32 and washer 40263 in between.

*b*) Figure 203
Mount the unit thus formed on the spool bracket N3 EL 106 securing it with a flexible clip 45281.

*c*) Figure 204
Put the crank N3 EL 3 in place on the bracket N3 EL 106. Place the shaft of the ribbon advance wheel N3 GL 10 S in position with washer N3 L 11.

Arrange the spring N3 L 30 on the shaft of the N3 GL 10 S. Insert a clip N3 L 14 in the groove of the same shaft. Secure the clip.

*d*) Figure 203
Hook the spring N V 45 from the bracket N3 EL 106 to the pin **P** of the N3 GL 108.

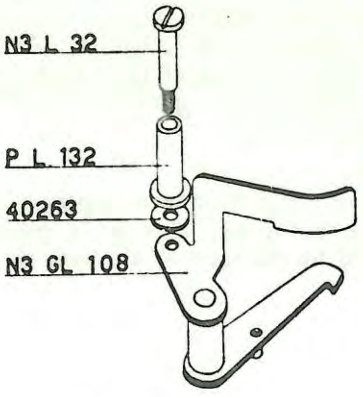


fig. 202

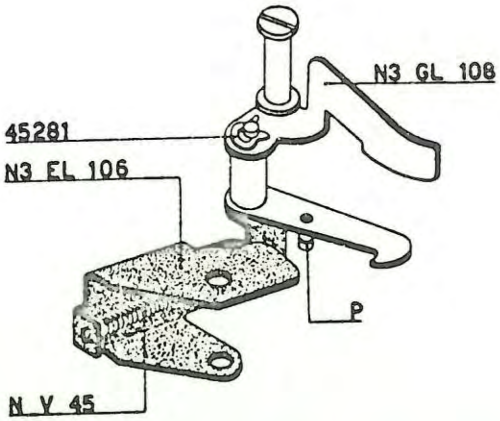


fig. 203

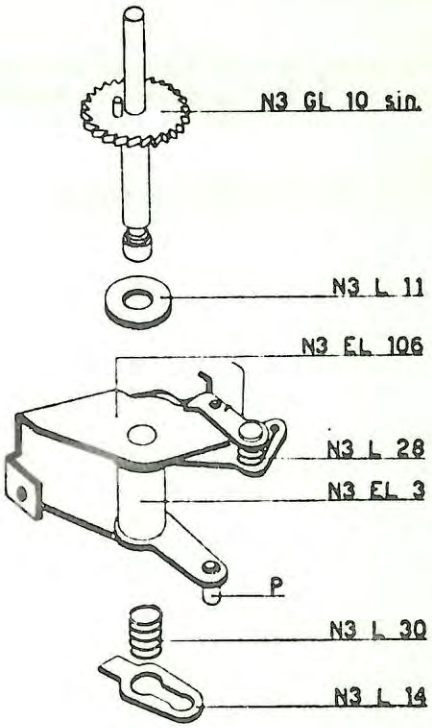


fig. 204

## Preparing the motor wheels unit.

### MC 14 D - M - E

*a*) Figure 205

Hook the spring N V 45 between the drag tooth **D** of the control plate N EV 3 and the corresponding spring holder **P**.

*b*) Figure 205

On the pin N3 V 8 lodge in order:

— the control plate N3 EV 3;
— the driving wheel N EV 7. The lug **C** of the N3 EV 3 should be inserted in one of the spaces in the toothed wheel (not visible in the figure) of the N EV 7;
— the bushing N V 67.

c) Figure 205

Put the unit thus formed in position on the bracket N3 V 1 screwing the pin N V 8 in counter clockwise. This pin should be clamped all the way down.

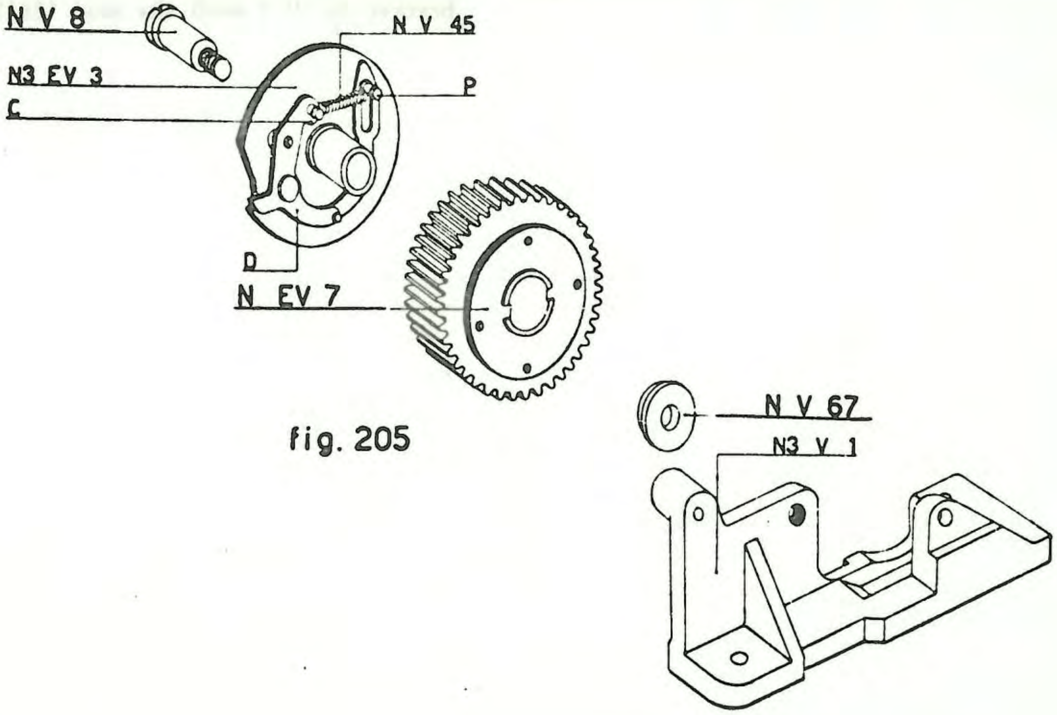


fig. 205

*d*) Figure 206

On the hub N3 GV 24 lodge in order:

— the gear wheel N3 V 21;
— the friction disk N3 GV 22;
— the leaf spring for the friction N3 V 27;
— the special nut N3 V 45 (which should be screwed down enough to bring the leaf spring N3 V 27 to a slight tension);
— the gear pinion N3 V 25.

e) Figure 207

Place the unit thus formed in position on the bracket N3 V 1 with the pin N3 V 20 and its nut 138505.

*f*) Figure 207

Place the starting lever N3 EV 11 in position on the bracket N3 V 1 with the stud 126353.

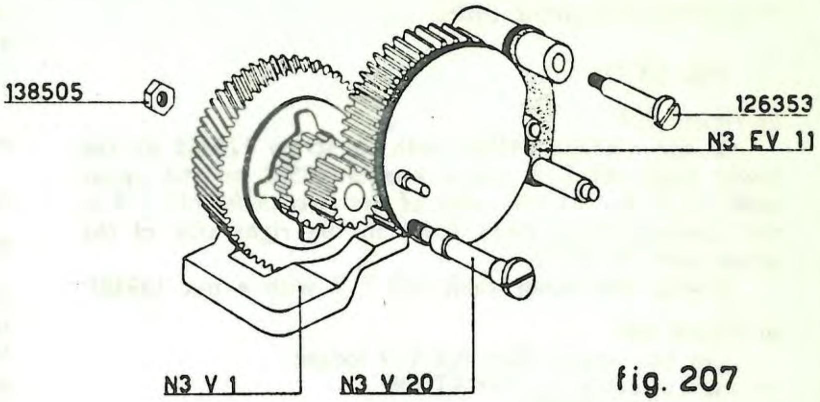


fig. 207

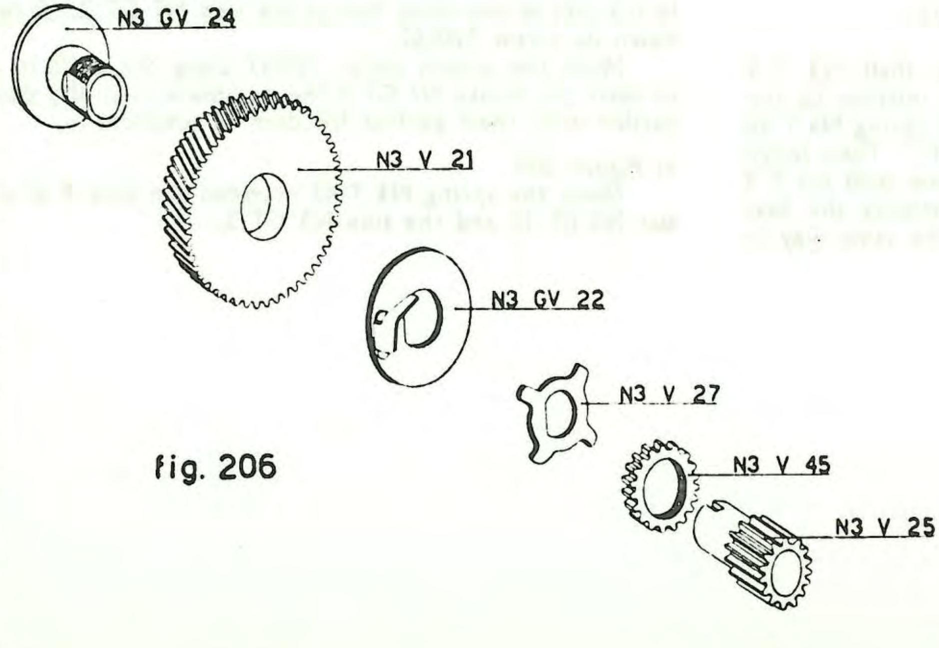


fig. 206

## Preparing the print unit.

### MC 14 D

*a*) Figure 208

Lodge a collar 142517 with its screw 120262 on the lower shaft N3 T 9, and a washer 40503 on the upper shaft N3 T 9. Put the ends of the two shafts N3 T 9 in the corresponding guide holes in the right side of the print unit N3 GT 2.

Clamp the lower shaft N3 T 9 with a nut 138351.

*b*) Figure 208

On the upper shaft N3 T 9 lodge:

— the restoring bar N3 ET 18;
— the washer 40505;
— the outer special signs lever N3 GT 11;
— eleven zero stop levers N3 GT 10.

Fix a hook N3 GT 8 on the lower shaft N3 T 9 positioning it as shown in the figure in relation to the corresponding lever N3 GT 11. Hook the spring N3 T 46 between the N3 GT 8 and the N3 GT 11. Then lodge another eleven hooks N3 GT 8 on the same shaft N3 T 9 following the instructions given for assembling the first group. They must all be positioned in the same way in relation to the corresponding N3 GT 10. Between them and the N3 GT 10 hook as many springs N3 T 46.

*c*) Figure 208

Lodge a collar N3 D 31 with its screw 120262 on the right end of the upper shaft N3 T 9.

Lodge a collar 142517 with its screw 120262 on the right end of the lower shaft N3 T 9.

*d*) Figure 208

Hold the upper shaft N3 T 9 against the side N3 GT 2. Adjust the position of the collar N3 D 31 so as to allow the bar N3 ET 18 and the levers N3 GT 11 and N3 GT 10 the minimum axial play compatible with their prefect freedom of rotation.

Bring the collar 142517 of the lower shaft N3 T 9 to 0.5 mm of the inner face of the side N3 GT 2. Screw down its screw 120262.

Move the second collar 142517 along the shaft so as to leave the hooks N3 GT 8 the minimum axial play compatible with their perfect freedom of rotation.

*e*) Figure 208

Hook the spring N3 T 44 between the hole F of the bar N3 ET 18 and the side N3 GT 2.

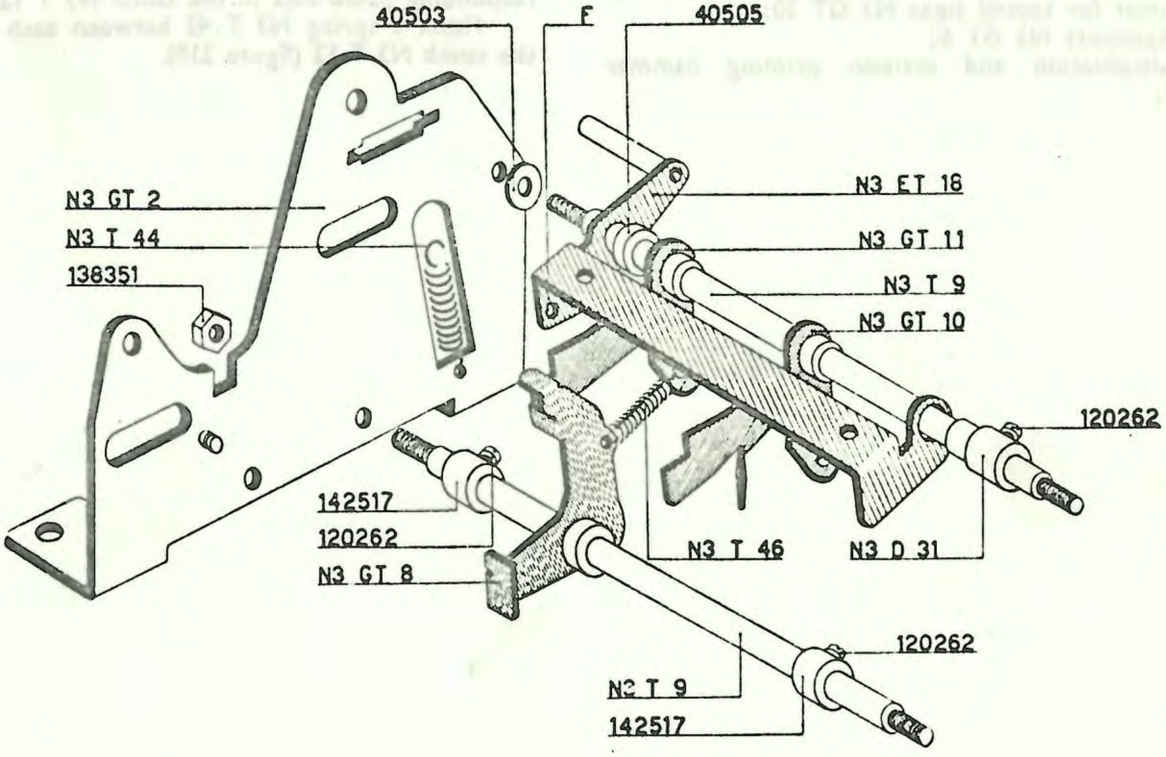

40503
F
40505
N3 GT 2
N3 T 44
138351
N3 ET 18
N3 GT 11
N3 T 9
N3 GT 10
120262
142517
120262
N3 GT 8
N3 T 46
N3 D 31
120262
N2 T 9
142517

fig. 208

*f*) Figure 209

On the shaft of the hammer segments N3 T 13 lodge in order:

- the right bend of the alignment unit N3 GT 135;
- the hammer for special signs N3 GT 30;
- eleven hammers N3 GT 6;
- the multiplication and division printing hammer N3 GQ 15;
- the left bend of the N3 GT 135.

*g*) Figures 209 - 210

Insert the lower shanks of the hammers in the corresponding guide slits in the comb N3 T 12 (figure 209).

Hook a spring N3 T 42 between each hammer and the comb N3 T 12 (figure 210).

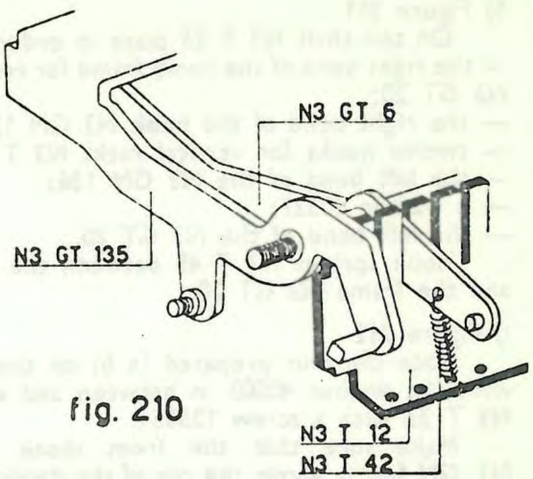


fig. 210

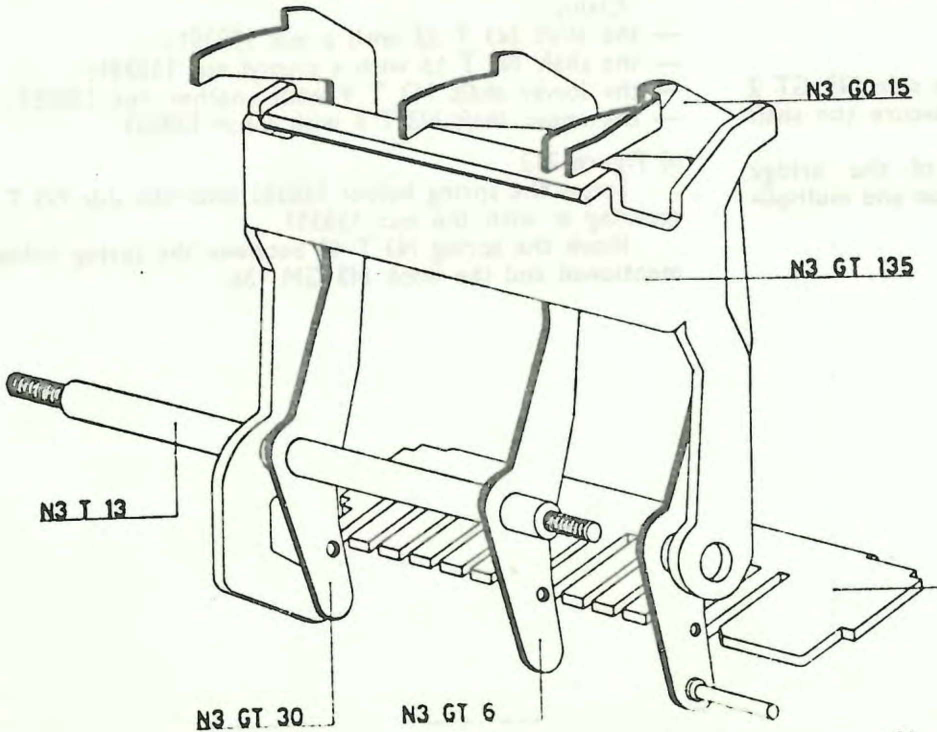


fig. 209

*h*) Figure 211

On the shaft N3 T 23 place in order:

— the right bend of the comb frame for restoring hammers N3 GT 20;

— the right bend of the hook N3 GM 136;

— twelve hooks for vertical racks N3 T 19;

— the left bend of the N3 GM 136;

— a washer 40521;

— the left bend of the N3 GT 20.

Hook springs N3 T 45 between the hooks N3 T 19 and the frame N3 GT 20.

*i*) Figure 212

Place the unit prepared in *h*) on the side N3 GT 2 with the washer 40503 in between and secure the shaft N3 T 23 with a screw 125354.

Make sure that the front shank of the bridge N3 GM 136 is above the pin of the division and multiplication hammer N3 GQ 15.

*l*) Figure 212

Place the comb N3 T 12 in position on the side N3 GT 2; at the same time introduce the shaft N3 T 13 into the guide hole of the same side with the washer 40503 in between.

Secure the shaft N3 T 13 with the nut 138351.

*m*) Figure 212

Assemble the left side of the print unit N3 T 1; put a washer 40503 on the shaft N3 T 23.

Clamp:

— the shaft N3 T 23 with a nut 138351;

— the shaft N3 T 13 with a second nut 138351;

— the lower shaft N3 T 9 with another nut 138351;

— the upper shaft N3 T 9 with a nut 138351.

*n*) Figure 212

Screw the spring holder 136353 onto the side N3 T 1 securing it with the nut 138351.

Hook the spring N3 T 45 between the spring holder mentioned and the hook N3 GM 136.

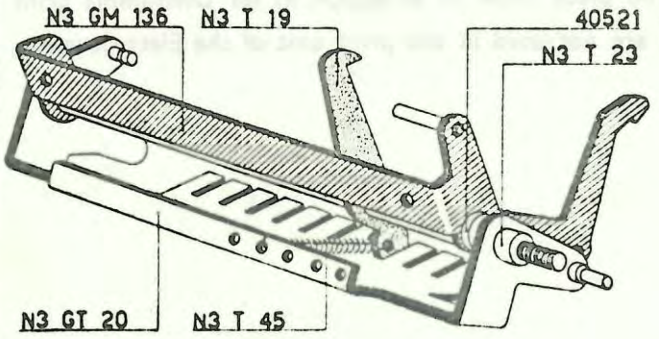


fig. 211

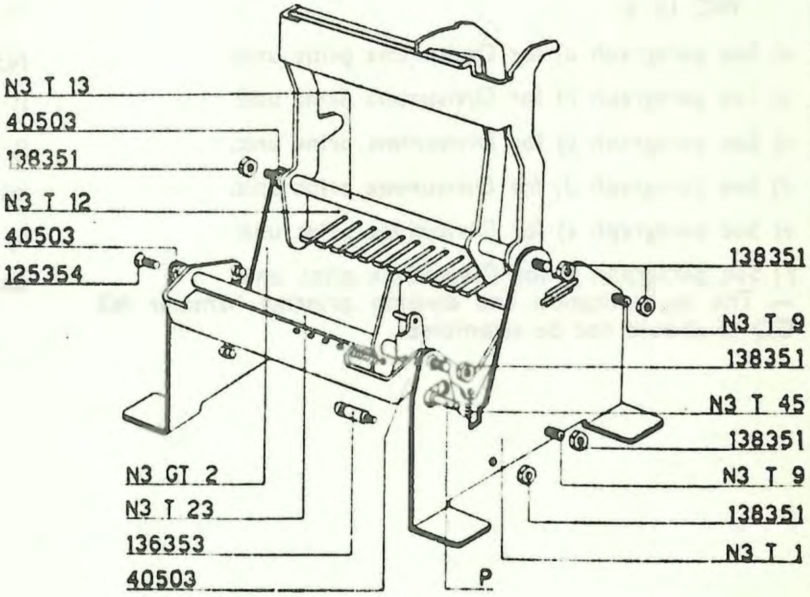


fig. 212

## MC 14 M

See the instructions for assembling the Divisumma print units.

Hammer segment N3 GM 133 should be used in place of hammer N3 GQ 15 (paragraph *f*).

## MC 14 E

*a*) See paragraph *a*) for Divisumma print unit.

*b*) See paragraph *b*) for Divisumma print unit.

*c*) See paragraph *c*) for Divisumma print unit.

*d*) See paragraph *d*) for Divisumma print unit.

e) See paragraph e) for Divisumma print unit.

*f*) See paragraph *f*) for Divisumma print unit.
— The multiplication and division printing hammer N3 GQ 15 should not be assembled.

*g*) See paragraph *g*) for Divisumma print unit.

*h*) Figure 213
On the shaft N3 T 23 place in order:
— the right bend of the comb frame for restoring hammers N3 GT 20;
— twelve hooks for vertical racks N3 T 19;
— the left bend of the N3 GT 20.
Hook the springs N3 T 45 between the hooks N3 T 19 and the frame N3 GT 20.

*i*) See paragraph *i*) for Divisumma print unit.

*l*) See paragraph *l*) for Divisumma print unit.

*m*) See paragraph *m*) for Divisumma print unit.

*n*) The piece listed in paragraph *n*) for Divisumma print unit are not used in the print unit of the Elettrosumma.

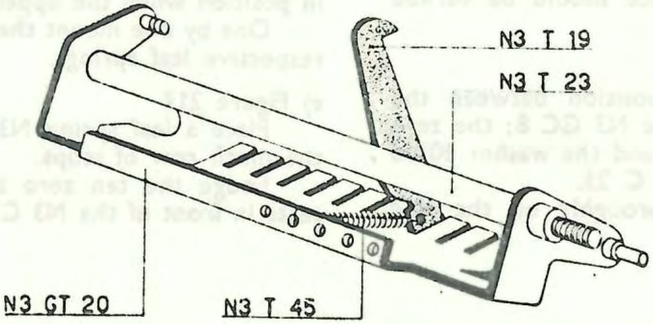


fig. 213

**Preparing the stop section.**

**MC 14 D**

*a*) Figure 214.

Fix the lower plate N3 C 10 to the two sides of the slide N3 GC 7 and N3 GC 8 with four screws 125357.

*b*) Figure 214

Place the distance piece N3 C 13 in position on the lower plate N3 C 10 securing it with a screw 125305 which should only be partially screwed in. The wide part of the conic hole of the distance piece should be turned towards the exterior of the slide.

*c*) Figure 215

Place the shaft N C 23 in position between the distance piece N3 C 13 and the side N3 GC 8; the zero plate N3 C 12, the spring N3 C 18 and the washer 40366 are then mounted on the shaft N C 23.

Clamp the shaft N C 23 thoroughly on the side N3 GC 8.

Put the flexible clip 45281 in place. Secure the distance piece N3 C 13 on the plate N3 C 10, screwing the screw 125305 all the way in (figure 214).

Check that the zero plate N3 C 12 is perfectly free to rotate. Secure the shaft N C 23 with the screw 120262.

*d*) Figures 215 - 216

Lodge the stops N3 C 1 of the first row in their proper seats as shown in figure 215. Put the leaf spring N3 C 4 (figure 216), which serve for the second row of stops, in front of them.

The leaf spring for the first row of stops will be put in position when the upper plate of the slide is mounted.

One by one mount the other rows of stops with their respective leaf springs.

*e*) Figure 217

Place a leaf spring N3 C 4 upside down in front of the ninth row of stops.

Lodge the ten zero stops N3 C 3 in their proper seats in front of the N3 C 4.

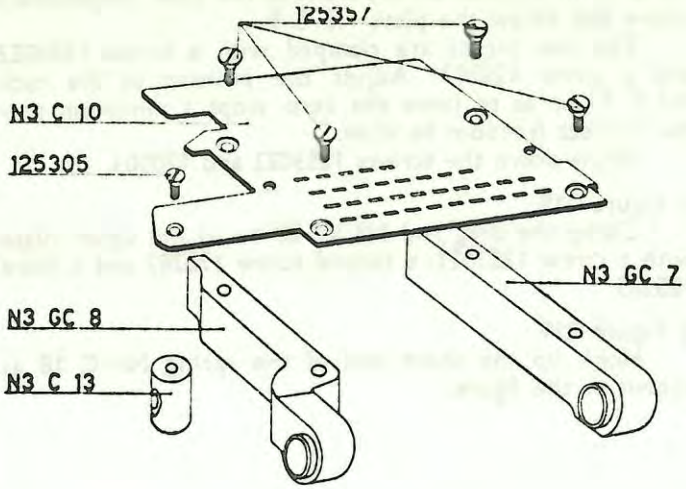


fig. 214

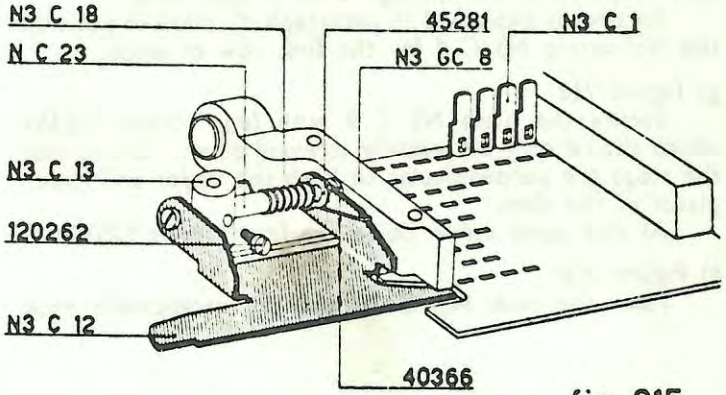


fig. 215

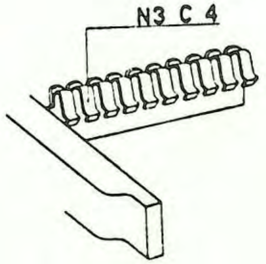


fig. 216

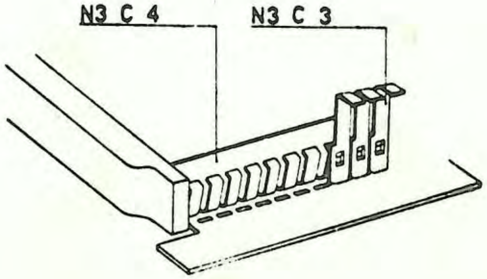


fig. 217

*f*) Figure 218

Place the upper plate of the slide N3 C 9 in position so that the stops are lodged in their proper seats and the zero stops come out through their proper slots.

As already explained in paragraph *d*), place in position the leaf spring N3 C 4 for the first row of stops.

*g*) Figure 218

Secure the plate N3 C 9 with four screws 125354 which should only be partially screwed down. Check that the stops are perpendicular to both the upper and lower plates of the slide.

At this point screw down the four screws 125354.

*h*) Figure 218

Place the rack N3 Q 18 and the escapement rack N3 C 11 in position on the front of the slide, respectively above and below the plate N3 C 9.

The two pieces are clamped with a screw 1253022 and a screw 120303. Adjust the position of the rack N3 C 11 so as to leave the zero stops a minimum play but perfect freedom to slide.

Screw down the screws 1253022 and 120303.

*i*) Figure 219

Clamp the drag rod N3 W 20 on to the upper plate with a screw 1253021, a second screw 120262 and a third 125265.

*l*) Figure 219

Hook up the short end of the spring N3 C 18 as shown in the figure.

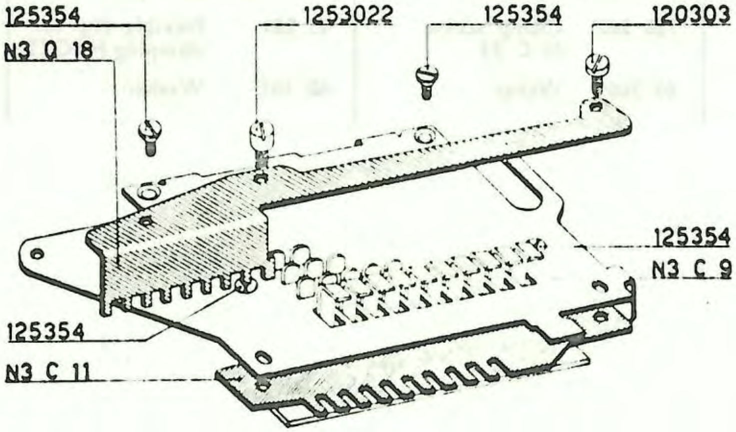


fig. 218

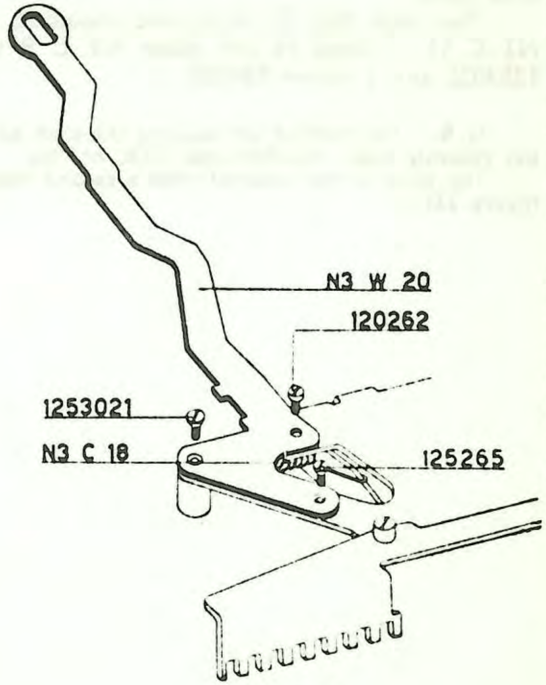


fig. 219

*m)* Figure 220
Insert the plug 322010 in the holes **F.**

## MC 14 M - E

See the instructions for assembling the Divisumma slide unit.

The rack N3 Q 18 is not mounted, so the rack N3 C 11 is fixed to the plate N3 C 9 with a screw 1253022 and a screw 120302.

N. B. - The method for securing the shaft to the zero plate has recently been modified (see T.I.B. nº. 46).

The shaft is now secured with a second flexible clip 45281 (figure 221).

A washer 40402 (not seen in the figure) must be placed between the zero plate and the new side of the slide N3 GC 107.

| SUPERSEDED PARTS | NEW PARTS |
|---|---|
| N C 23 Zero plate shaft | N3 C 21 Zero plate shaft |
| N3 C 13 Distance piece | N3 C 113 Distance piece |
| N3 GC 7 Slide side | N3 GC 107 Slide side |
| 120 262 Clamp screw N C 23 | 45 281 Flexible clip for clamping N4 C 15 |
| 40 366 Wsher | 40 402 Washer |

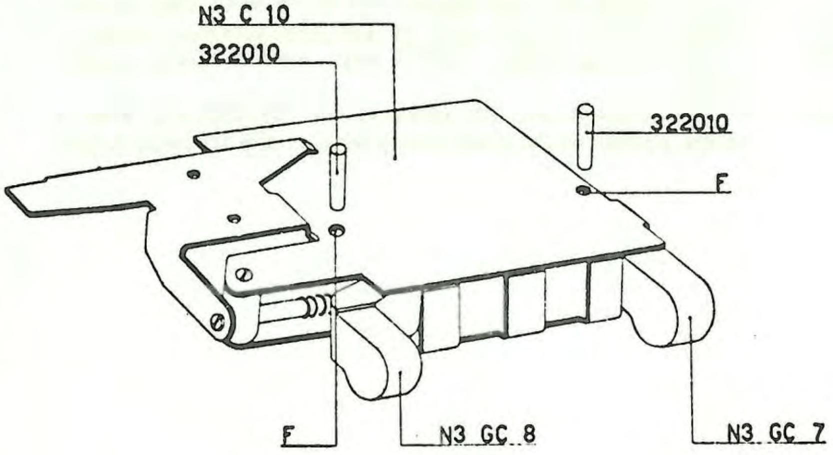


fig. 220

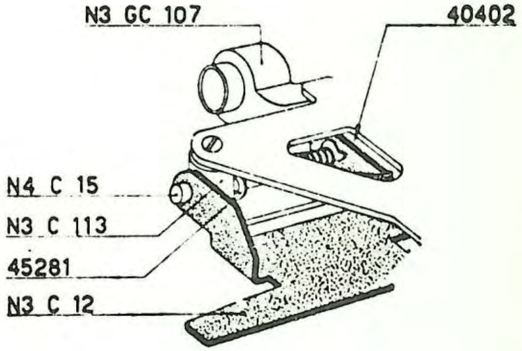


fig. 221

## Preparing the keyboard unit.

### MC 14 D

*a*) Figure 222

On the lower keyboard plate N3 EB 22 place in order:

— the front left distance bracket N3 GB 42 with two screws 120302;

— the left back distance bracket N3 B 43 with two screws 120302;

— the lever shafts bracket N3 B 19 with two screws 120302 which should only be partially screwed down;

— the adjustable plate N3 B 35 with two screws 120262 which should only be partially screwed down;

— the comb for the setters N3 B 18 with two screws 120262 which should only be partially screwed down;

— the spring holder 136302 with washer 40312 underneath;

— the bracket for the zeros setter N3 GQ 102 with a screw 120303 which should only be partially screwed down.

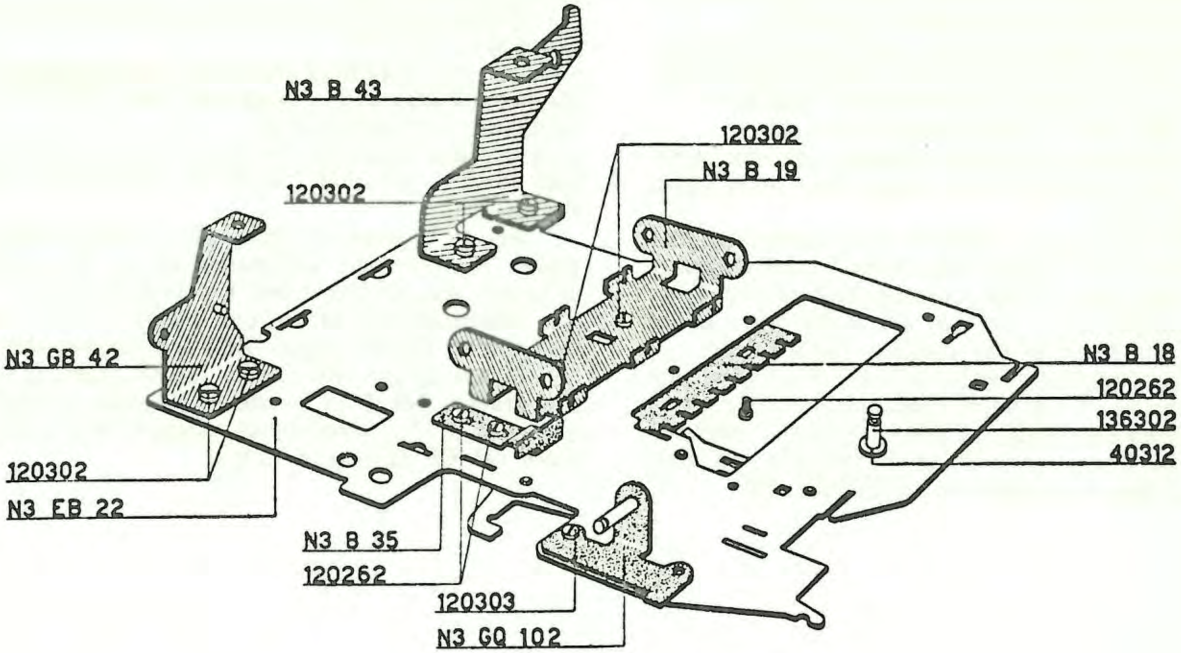

N3 B 43
120302
N3 B 19
120302
N3 GB 42
N3 B 18
120262
136302
40312
120302
N3 EB 22
N3 B 35
120262
120303
N3 GQ 102

fig. 222

*b*) Figures 223 - 224

Assemble the kinematics bracket N3 B 16 (figure 223) on the lower keyboard plate N3 EB 22 with two screws 120303 and two collars **C** in between. These latter should keep the bracket N3 B 16 raised clear of the plate so that the shaft N3 B 17 can be placed in position.

There are nine kinematics, i.e. one for each number key. They are differentiated from each other (figure 228):

— by having or not having the horizontal link **B**;

— by having this link either shorter or longer;

— by having the square **S**, placed between the key carrying stem and the horizontal link, either bent or straight.

So we find that:

1st. — the kinematics with the long horizontal link are those of the 1 - 4 - 7 keys; that of the 1 has the square bent towards the rear of the machine, that of the 4 has the square straight while that of the 7 has the square bent towards the front of the machine (figure 228);

2nd. — the kinematics with the short horizontal link are those of the 2 - 5 - 8 keys; those of the 2 and the 5 have their square bent towards the rear of the machine, the bend of the kinematic 2 being the longer; the kinematic of the 8 has a straight square (figure 228);

3rd. — the kinematics without a horizontal link are those of the 3 - 6 - 9 keys. Those of 3 and 6 have a bridge setter but are easily recognized since the bridge of 3 is longer than that of 6 (figure 223). The kinematic for 9 is the simplest one.

To assemble the kinematics on the bracket N3 B 16, proceed as follows:

— place the kinematic for 9 in the corresponding guide slit (figure 223) and advance the shaft N3 B 17 until the kinematic is pivoted on it;

— place the kinematic for 8 in the corresponding guide slit; advance the shaft N3 B 17; continue in order with the others.

As can be seen by figure 224, washers 40284 must be placed between the kinematics of the 8 and the 9 and between that of the 4 and the bridge of the 3.

When all the kinematics are in place, unscrew the two screws 120303 (figure 223) and remove the collars **C**.

Screw up the two screws 120303 again so as to clamp the bracket N3 B 16 to the lower plate N3 EB 22. The shaft N3 B 17 is fixed by the sides of the notches in the plate N3 EB 22 (figure 224).

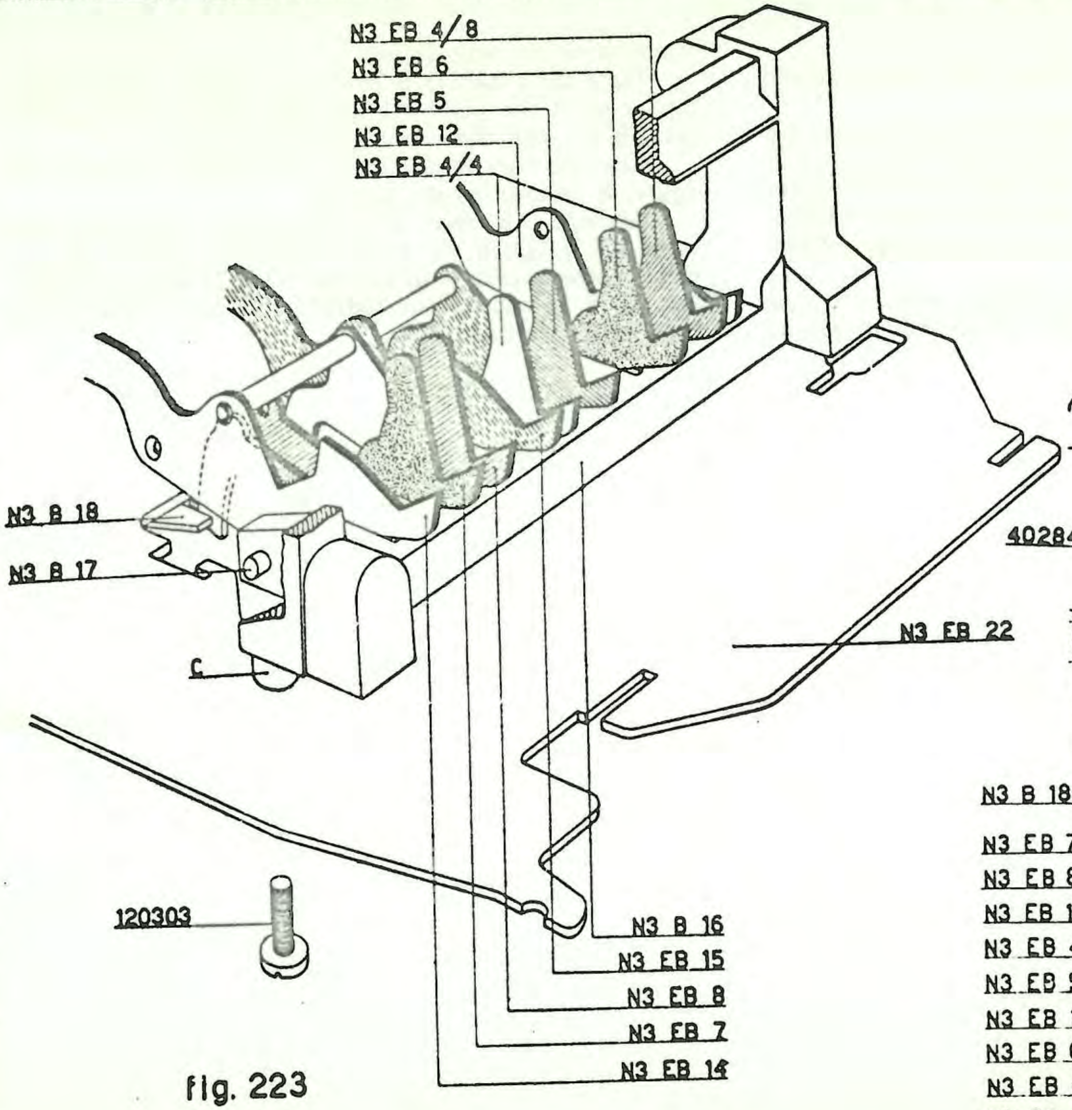
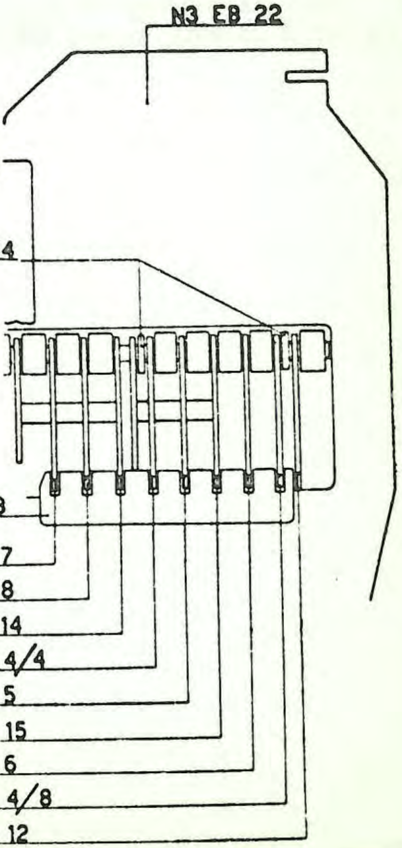


fig. 223

fig. 224



*c*) Figure 225

Hook nine springs N B 65 on the spring holder N3 GB 21.

Place the spring holder N3 GB 21 in position on the bracket N3 B 16 so that its two lateral pins **P** are inserted in the corresponding holes in the sides of the bracket itself. Secure the N3 GB 21 with two screws 120261.

Hook the springs N B 65 to the correspondings setters.

*d*) Figure 226

Place the eccentric N3 B 32 in place on the universal bar N3 B 23 with its nut 138261 which should not be screwed all the way down.

Place the shaft N3 B 26 on the bracket N3 B 16 and mount on it the universal bar N3 B 23 and the lock bar N3 GB 25 with their two screws N3 B 72.

The two bars should be in the position shown in the figure in relation to the setters.

Arrange the lower part of the pull rod for the zero stops N3 B 124 in the guide slits of the lower keyboard plate; above secure it to the bar N3 B 23 with the eccentric N3 B 36 and its nut 138261. The latter should only be partially screwed on.

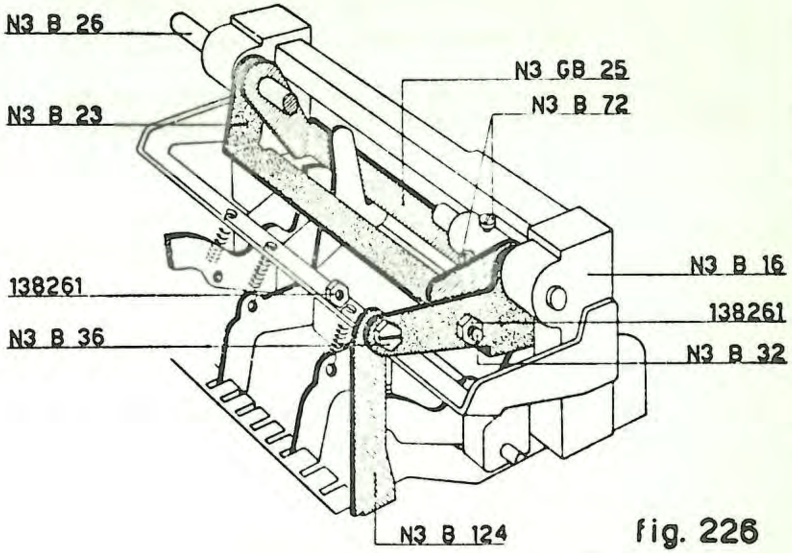


fig. 226

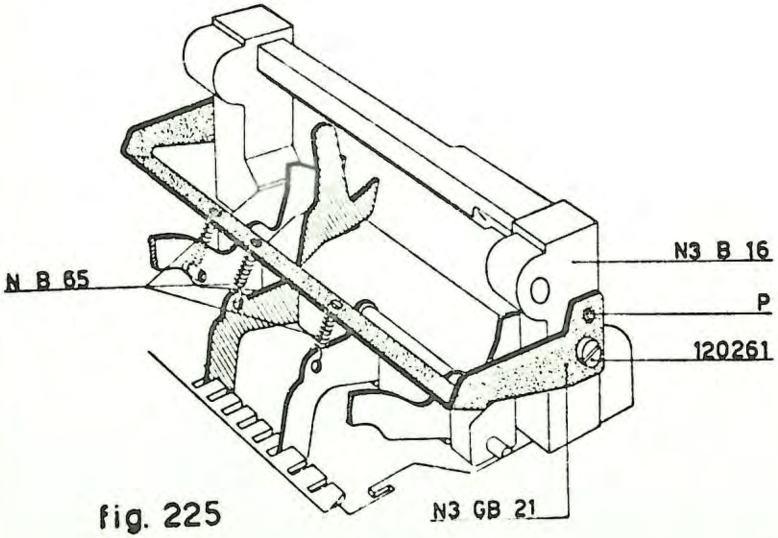


fig. 225

e) Figure 227

Place the keyboard lock piece N3 B 73 in position on the universal rod N3 EB 28 with the eccertric N3 B 36 and its nut 138261 which should not be screwed all the way down.

Place the universal link N3 EB 28 in position on the keyboard so that the hub of its lever **L** lodges on the shaft N3 B 26 and the lock piece N3 B 73 is inserted in the proper guide slit of the lower keyboard plate.

Check that the hook **G** has come to the position shown in the figure.

Secure the bracket **S** of the rod N3 EB 28 with two screws 120302.

Hook the spring N3 T 45 between the levei **H** and the stop **A**.

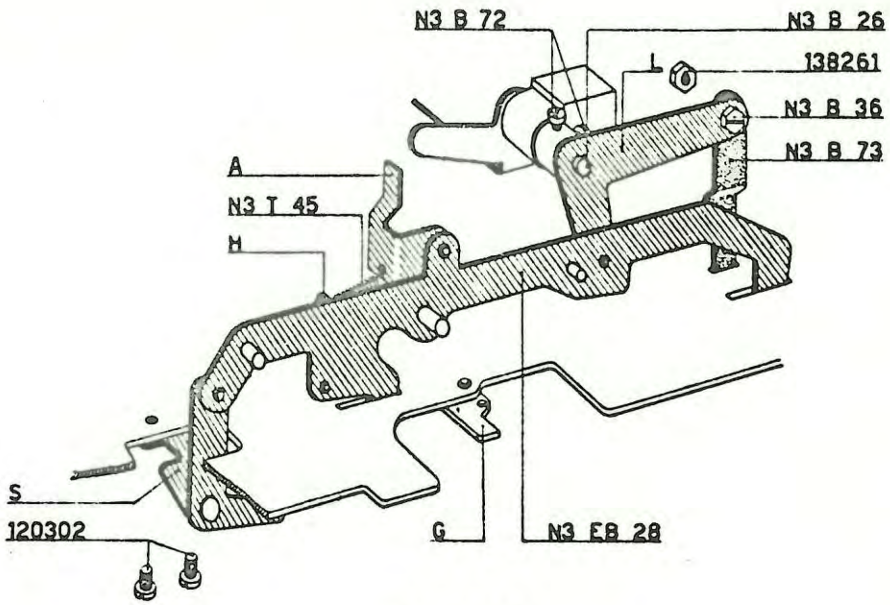


fig. 227

*f*) Figure 228

Pivot the squares S of the 1 - 2 - 4 - 5 - 7 - 8 key kinematics on the two shafts N3 B 20 and N3 Q 79 for the purpose, making sure that the lower shanks of the squares are inserted in the correspondings guides of the bracket N3 B 19.

Secure the shaft N3 B 20 with two flexible clips 45221 and the shaft N3 Q 79 with a single clip 45221 (front side of the shaft).

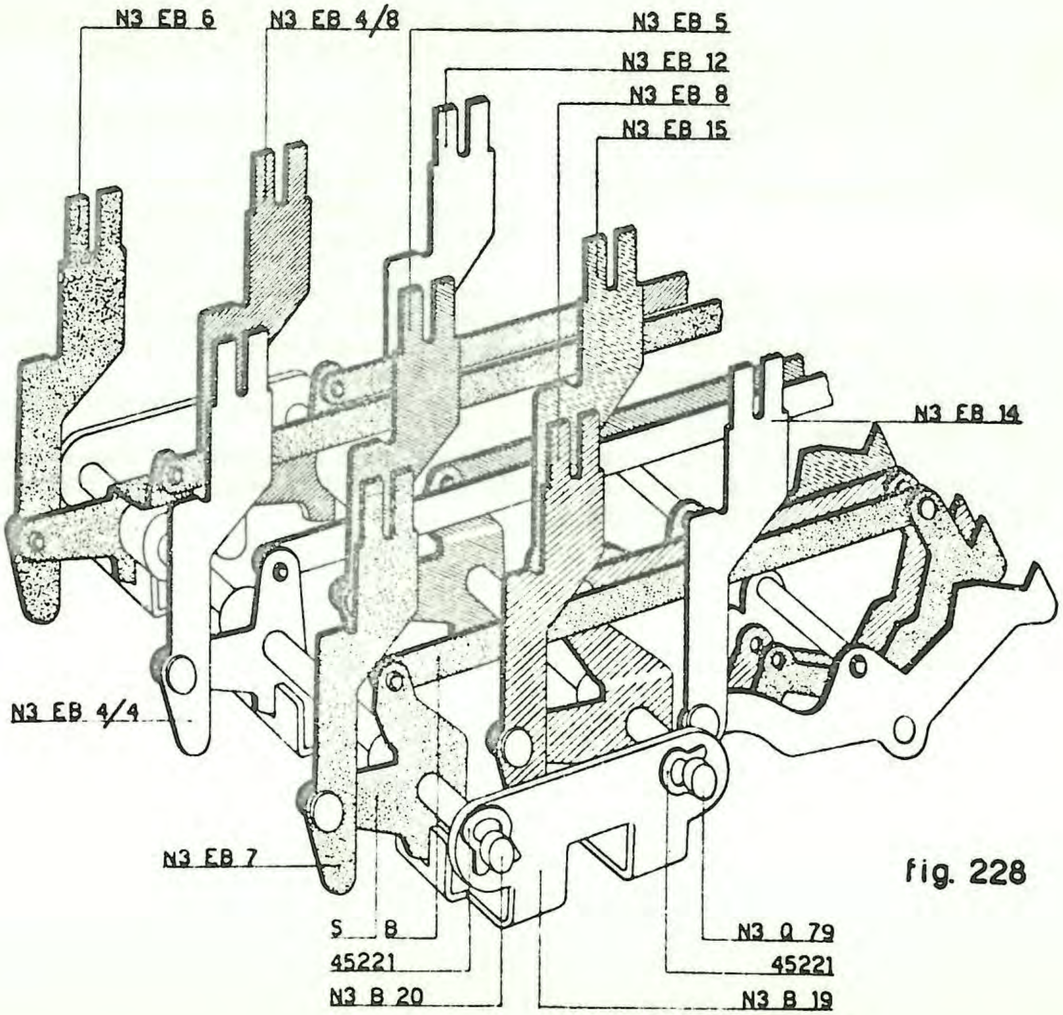

N3 EB 6
N3 EB 4/8
N3 EB 5
N3 EB 12
N3 EB 8
N3 EB 15
N3 EB 14
N3 EB 4/4
N3 EB 7
S B
45221
N3 B 20
N3 Q 79
45221
N3 B 19

fig. 228

*g)* Figure 229

Lodge the starter lever rocker N3 GQ 70 and the starter lever N3 GQ 78 on the rear part of the shaft N3 Q 79. Move the unit thus formed along the shaft N3 Q 79 so as to leave the shaft itself a slight axial play. Secure with a screw 122301.

Hook the spring N3 Q 92 between the N3 GQ 70 and the NE GQ 78.

*h)* Figure 230

Turn the bar N3 GB 25 pushing it slightly towards the point shown by the arrow. This causes the bar N3 B 23 also to be pulled round by the rotation and it stops when the pull rod N3 B 124 comes in contact with the lower plate of the keyboard.

In these conditions, gently lower the stem of the key 6 kinematic (N3 EB 15) until its stop **A** rests on the bar N3 B 23. In this position there should be a clearance of 5 mm between the bottom of the key stem and the lower keyboard plate. The condition is reached by moving the eccentric N3 B 36 as required.

*i)* Figure 231

Bring the bar N3 GB 25 into contact with the eccentric N3 B 32.

Lower the stem of the six key N3 EB 15 completely, i.e. until it enters into contact with the lower keyboard plate **P**. Release the bar N3 GB 25.

In these conditions there should be the clearance shown in the figure. The clearance required is obtained by moving the eccentric N3 B 23 as necessary.

As a counter check of this adjustment, carry out the following operation:

— bring the bar N3 GB 25 into contact with the eccentric N3 B 32;

— lower the 6 key slowly; its stop **H** should pass under the bar N3 GB 25 with a slight clearance.

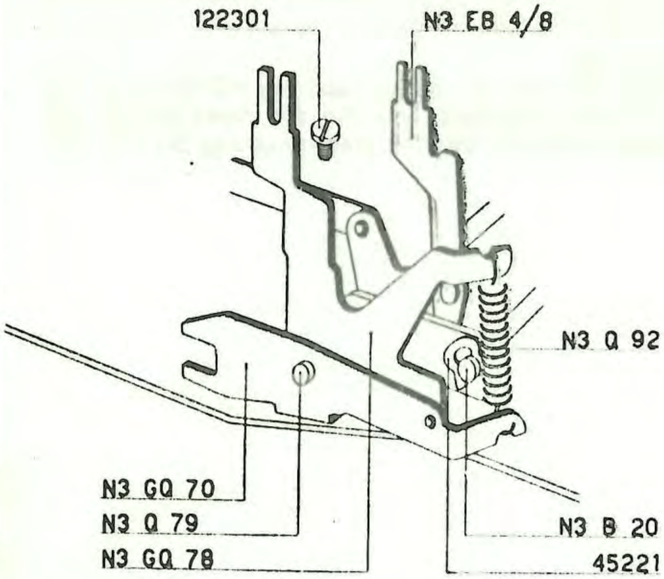


fig. 229

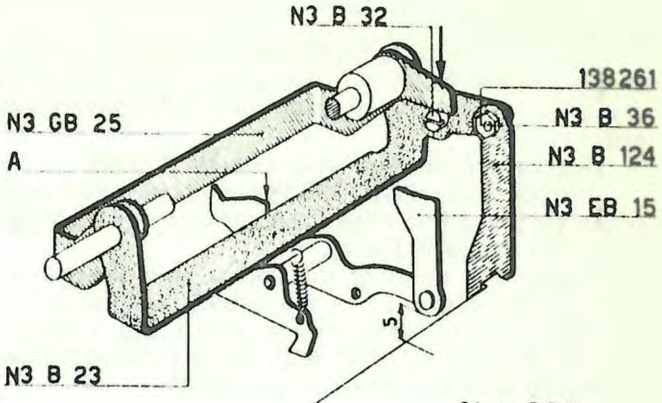


fig. 230

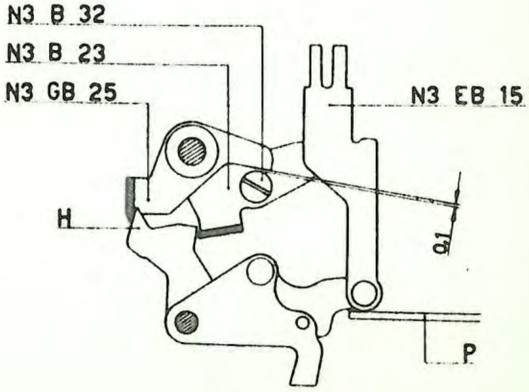


fig. 231

*l*) Figure 232

Place the bracket N3 GG 34 in position on the right of the bracket N3 B 16 making sure that its rear shank is inserted in the proper guide slit in the lower keyboard plate.

Secure the bracket with a screw 120303.

Introduce the shaft N3 G 14 between the rear brackets of the keyboard and lodge the subtraction frame N3 EG 27 on it (see figure 233 also).

Lodge the stems of the repeat and non print keys N3 EG 133 on the pin of the bracket N3 GG 34.

Connect the stems of the « 00 » and « 000 » keys N3 GB 40 and N3 GB 41 with the link N3 Q 101 which is secured with two flexible clips 45221.

Place the stem of the zero key N3 GB 39 and the two N3 GB 40 and N3 GB 41 in position on the back part of the keyboard, making sure that they are in the position shown in the figure in relation to the universal rod N3 EB 28.

Lodge the lever for complete entry of the zeros N3 GQ 100 on the pin of the bracket N3 GQ 102, securing it with a flexible clip 45221.

*m*) Figure 233

Lodge the stem of the non add key N3 GG 5 on the left side of the keyboard, and also the stems for the sub totals key N3 GG 1/P and the grand total key N3 GG 1/G.

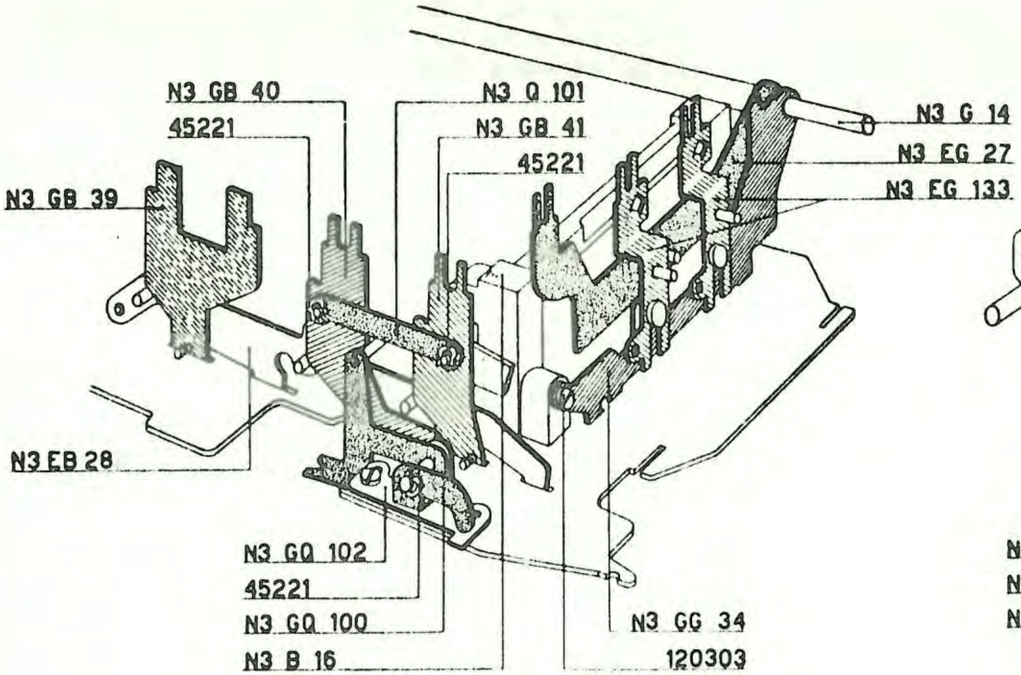


fig 232

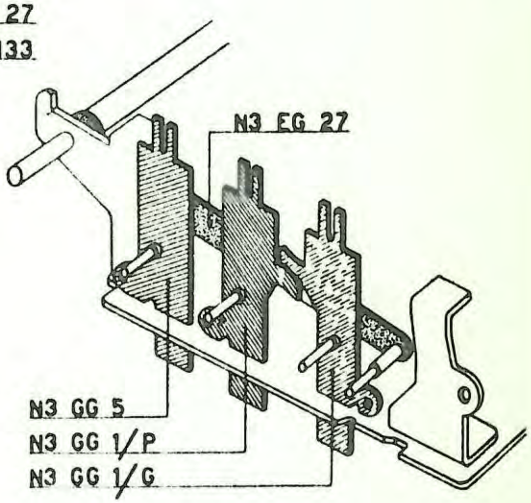


fig. 233

*n*) Figure 234

Place the upper keyboard plate N3 EB 50 in position so that all the stems of the keys are lodged in the corresponding guide slots. Secure the plate with four screws 1253023.

Hook three springs N3 G 51, six springs N3 T 46 and a spring N3 T 45 to the upper keyboard plate.

The springs N3 G 51 are then hooked to, respectively, the stems of the repeat and non print keys N3 EG 133 and the subtraction frame N3 EG 27.

The springs N3 T 46 are hooked to, respectively, the stems of the keys N3 GG 5, N3 GG 1/P, N3 GG 1/G, N3 GB 39, N3 GB 40 and N3 GB 41.

The spring N3 T 45 is hooked to the N3 GQ 100.

Hook the spring N3 G 54 between the hook **G** and the upper keyboard plate.

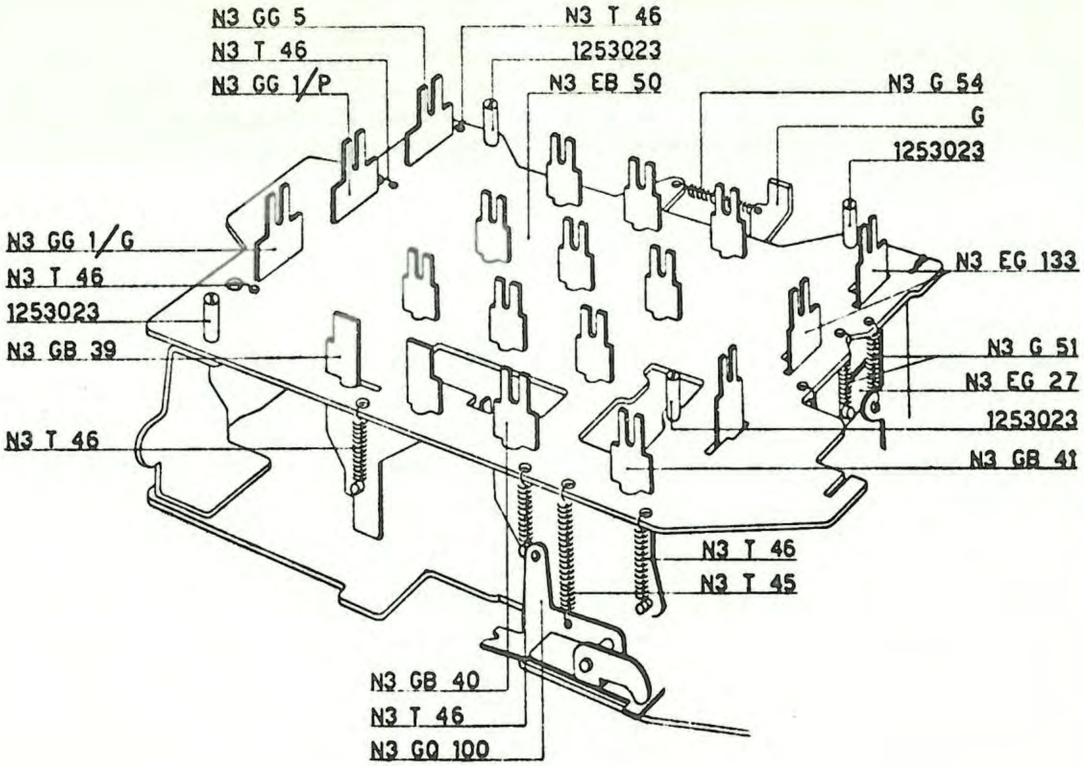

N3 GG 5
N3 T 46
N3 GG 1/P
N3 T 46
1253023
N3 EB 50
N3 G 54
G
1253023
N3 GG 1/G
N3 T 46
1253023
N3 GB 39
N3 EG 133
N3 G 51
N3 EG 27
1253023
N3 GB 41
N3 T 46
N3 T 46
N3 T 45
N3 GB 40
N3 T 46
N3 GQ 100

fig. 234

*o*) Figures 235 and 236

Centre the shaft N3 B 26 which should project the same amount from the lever **L** of the universal rod N3 EB 28 and from the rear side of the bracket N3 B 16.

Bring the front arm of the lock bar N3 GB 25 into contact with the eccentric N3 B 32 of the universal bar N3 B 23. Screw down the two screws N3 B 27 of the N3 GB 25 (figure 235).

Bring the hub of the lever **L** of the universal rod N3 EB 28 almost into contact with the bracket N3 B 16 so as to leave the shaft N3 B 26 the minimum axial play.

Keeping the front arm of the lock bar N3 GB 25 in contact with the eccentric N3 B 32 (figure 235) move the universal rod N3 EB 28 so as to obtain a clearance of 0.1 ÷ 0.2 mm between its pin **P** and the inclined plane of the zero key N3 GB 39 (figure 236).

Screw down completely the two screws N3 B 27 of the hub of lever **L** of the universal rod N3 EB 28.

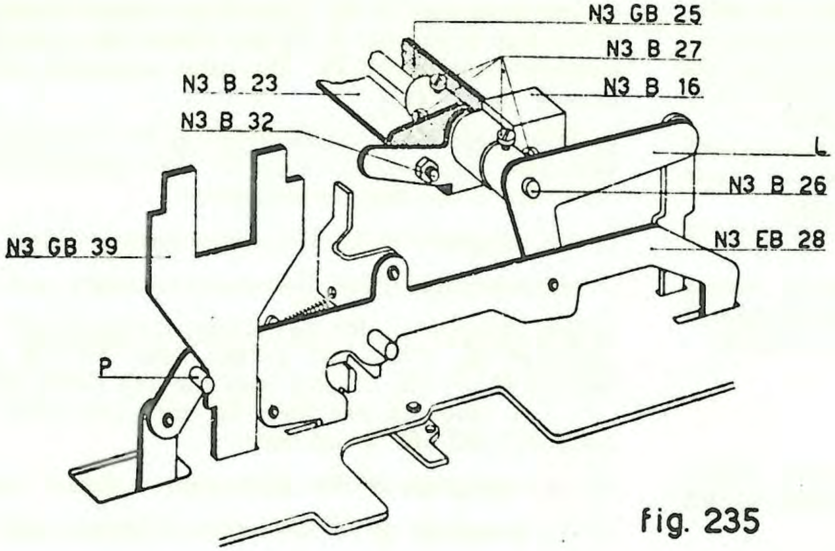


fig. 235

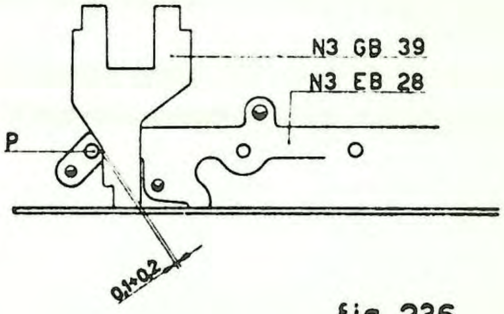


fig. 236

*p*) Figures 237 and 238

Adjust the position of the bracket N3 B 19. Proceed in the following order:

— lower the one and the six keys at the same time until their stems stop against the lower plate **P** of the keyboard;

— holding down the one key, check that the six key can rise for a distance **L**. When the six key is pressed, the universal bar should remain steady (figure 237);

— holding down the six key check that the one key can rise for a distance **L** (figure 238). When the one key is pressed, the universal rod should remain steady.

The same test should be carried out for the seven and six keys.

The required conditions can be reached by moving the bracket N3 B 19 as necessary. When the adjustment has been carried out, screw down the screws 120302.

## MC 14 M - E

*a*) See paragraph *a*) for Divisumma keyboard unit. However, the bracket N3 GQ 102 and the spring holder 136302 are not used.

*b*) See paragraph *b*) for Divisumma keyboard unit.

*c*) See paragraph *c*) for Divisumma keyboard unit.

*d*) See paragraph *d*) for Divisumma keyboard unit.

*e*) See paragraph *e*) for Divisumma keyboard unit.

*f*) See paragraph *f*) for Divisumma keyboard unit. The kinematics of the 2 - 5 - 8 also should be secured with a standard shaft N3 B 20. The latter is secured with two flexible clips 45221.

*g*) The pieces listed in paragraph *g*) for the Divisumma keyboard unit are not used on the keyboards of the Multisumma nor the Elettrosumma.

*h*) See paragraph *h*) for Divisumma keyboard unit.

*i*) See paragraph *i*) for Divisumma keyboard unit.

*l*) See paragraph *l*) for Divisumma keyboard unit. The stems of the «00» and «000» keys, N3 GB 40 and N3 GB 41 are not coupled with the link N3 Q 101.

And, naturally, the lever for complete entry of the zeros N3 GQ 100 is not used.

*m*) See paragraph *m*) for Divisumma keyboard unit.

*n*) See paragraph *n*) for Divisumma keyboard unit.

*o*) See paragraph *o*) for Divisumma keyboard unit.

*p*) See paragraph *p*) for Divisumma keyboard unit.

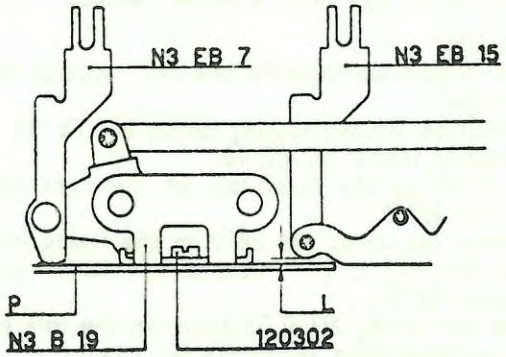


fig. 237

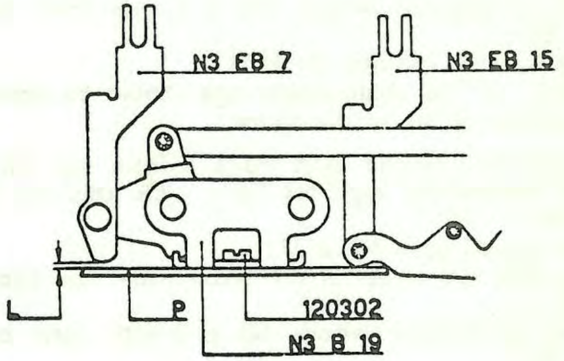


fig. 238

## Preparing the accumulator unit.

### MC 14 D - M - E

*a*) Figure 239

Introduce the shaft N3 E 5 from the left side of the accumulator cage N3 GE 7. Lodge on the shaft in order:
— the conical bus N3 E 27;
— the first left accumulator wheel (for subtraction) N3 GE 3;
— ten accumulator wheels N3 E 2 with their bushes N3 E 26;
— the distance bushing N3 E 28.

N.B. — The accumulator cage should be placed in the position shown in the figure.

*b*) Introduce a second shaft N3 E 5 from the left side of the accumulator cage N3 GE 7. On this one lodge in order:
— the conical bush N3 E 27;
— the first left wheel of the accumulator (for addition) N3 GE 4;
— ten accumulator wheels N3 E 2 with their bushes N3 E 26;
— the distance bushing N3 E 28.

No figure is given for this operation which is identical with the preceding one.

N.B. — The coupling between the addition and subtraction wheels is shown in figure 240. The shaded tooth is the return one. The wheels **A** are for addition, **S** for subtraction; **F** is the left side of the accumulator cage.

*c*) Figure 241

Secure the two small shafts N3 E 5 with the plate N3 E 22 which should be clamped on the right side of the accumulator cage with a screw 120262.

*d*) Figure 242

Place in position between the two sides of the accumulator cage:
— the addition wheels locking comb N3 EE 9;
— the locking frame N3 EE 10;
securing them on the inner face of the right side with flexible clips 45181.

Connect the comb N3 EE 9 to the frame N3 EE 10 with the link N3 E 11. Secure this latter with two flexible clips 45181.

Hook the spring N3 E 25 between the link N3 E 11 and the corresponding spring holder riveted on the left side of the accumulator cage.

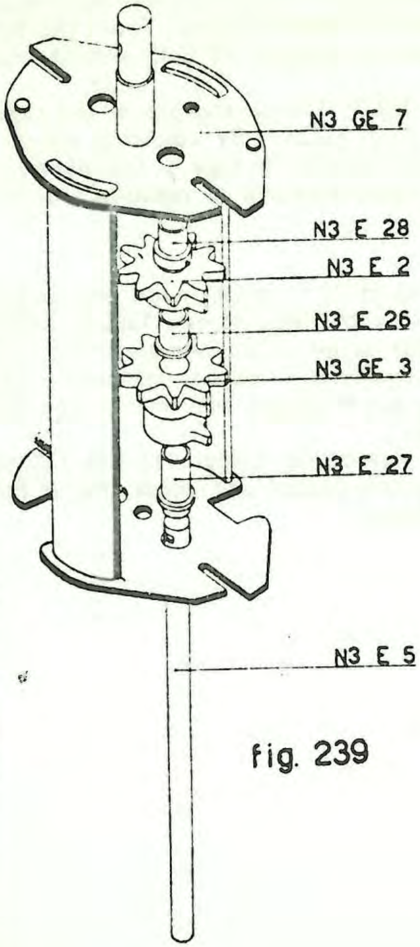


fig. 239

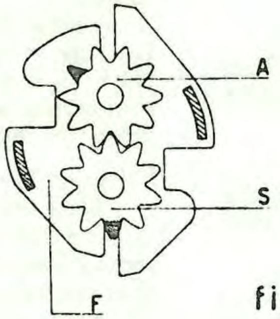


fig. 240

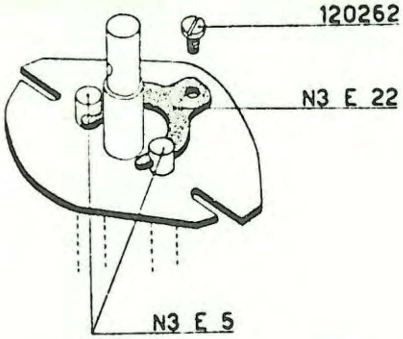


fig. 241

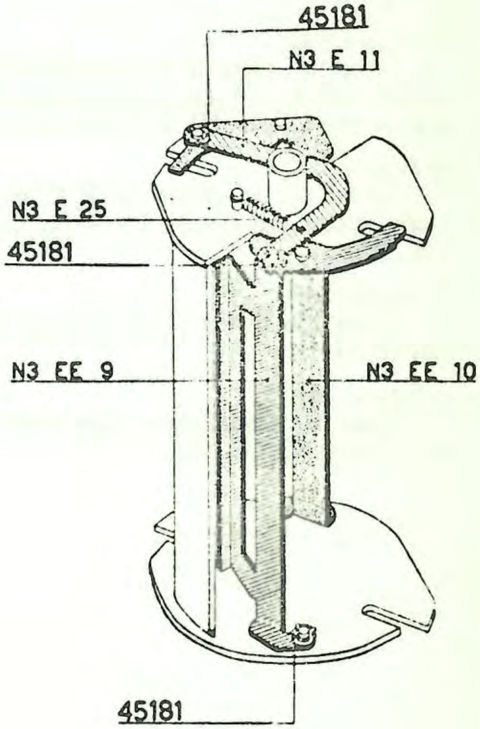


fig. 242

e) Figure 243

Screw the conical pin N3 E 23 with its nut 138506 on the right side of the accumulator suspension frame N3 GE 16.

*f*) Figure 243

Place the plate of the flexible coupling N3 EE 17 on the left side of the accumulator suspension frame N3 GE 16 with a conical pin N3 E 23 and its nut N3 E 18.

*g*) Figure 243

Screw the eccentric N3 E 19 on the left side of the accumulator suspension frame N3 GE 16 with its screw 1253027.

*h*) Figure 243

Hook the spring N3 E 24 from the N3 GE 16 to the N3 EE 17.

*i*) Figure 244

Place the accumulator cage in position on the suspension frame N3 GE 16.

The right pin of the cage is inserted in the hole made in the right side of the suspension frame. From the left side of the frame introduce the pin N3 E 13 with its nut 138407.

Lodge the pinion N3 H 116 on the pin of the cage, securing it with the plug 33224. By adjusting the pin N3 E 13, reduce the axial play of the cage to the minimum compatible with its perfect freedom of rotation. Screw down the nut 138407.

*l*) Figure 244

Place the comb N3 H 20 in position on the bridge N3 GH 121 securing it with three screws 120262 which should only be partially screwed in. Arrange the unit thus formed on the accumulator suspension frame. On the right lodge ite on pin **P** (figure 244) and on the left on pin $P_1$ (figure 243).

Reduce the axial play of the bridge N3 GH 121 to a minimum through gentle flexion and check that it has prefect freedom to rotate.

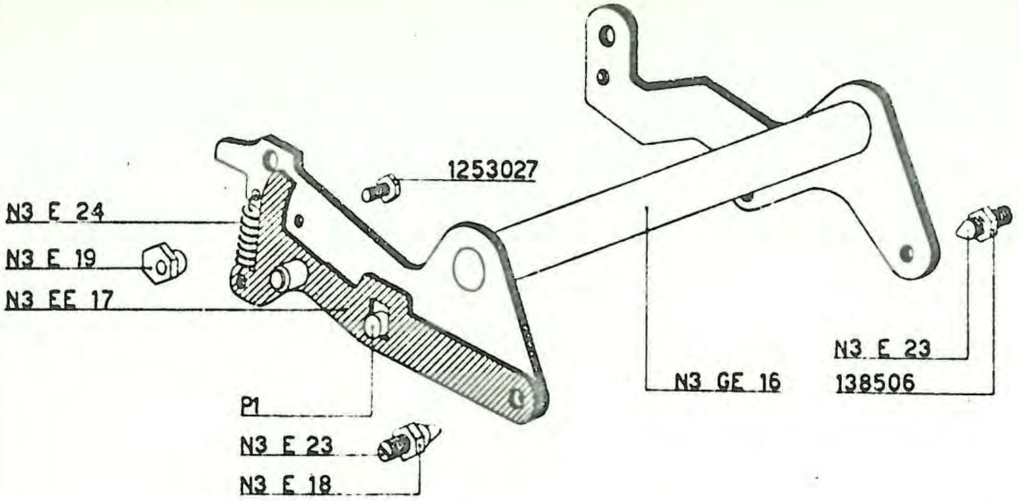


fig. 243

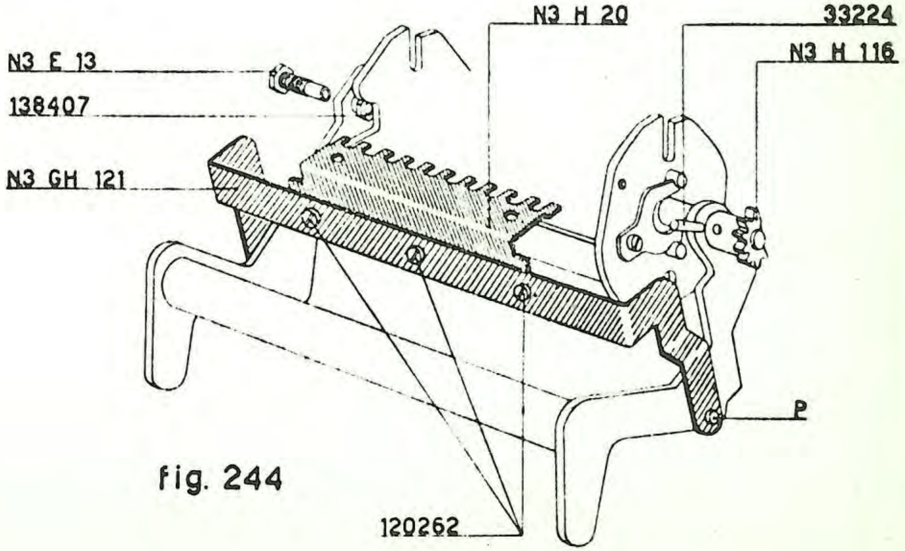


fig. 244

# PART TWO

# Instructions for Assembly and Adjustment

## MC 14 D - E (36" accumulator)

## 1 - Preparing the base.

MC 14 D - E

See paragraph 1 for MC 14 D - M - E (180°).
Only one spring holding plate N3 H 45, that on the right should be attached to the base.

## 2 - Preparing the left inner side N3 EA 103.

MC 14 D - E (Figure 245)

Place in position on the left inner side N3 EA 103:
*a*) the left keyboard clamping bracket N3 A 13 with two screws 120302;
*b*) the negative balance unit N3 EF 4 with the screw 120307, the special screw N3 F 10 with the distance collars 40313 in between. The two screws should only be partly screwed down. Hook the spring N3 F 14 between the levers of the unit as shown in the figure;
*c*) the left sides connecting column N3 A 6 with the nut 138405;
*d*) the bracket N3 A 24 with two screws 120303;
*e*) the two special screws N3 D 27 and their nuts 138305.

## 3 - Assembling the left inner side N3 EA 103 on the base.

MC 14 D - E (Figure 245)

Clamp the left inner side onto the base with a screw N3 A 9, a screw N3 A 26 and their nuts 138505.

## 4 - Preparing the right inner side N3 EA 204.

MC 14 D - E (Figure 246)

Place in position on the right inner side N3 EA 204:
*a*) the bracket N3 A 10 with two screws 120303;
*b*) the right sides connecting column N3 A 7 with the nut 138405.

## 5 - Assembling the inner right side N3 EA 204 on the base.

MC 14 D - E (Figure 246)

Clamp the right side to the base with a screw N3 A 8, a screw N3 A 9 and their nuts 138505.

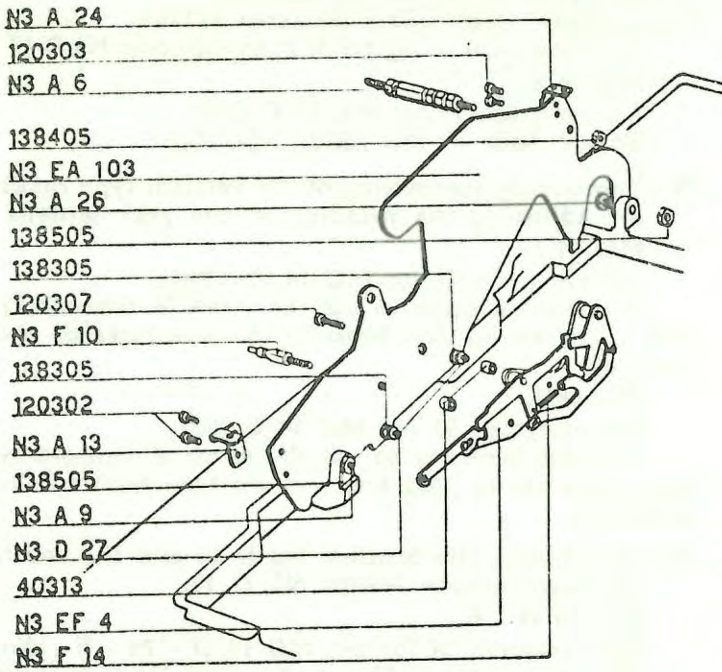


fig. 245

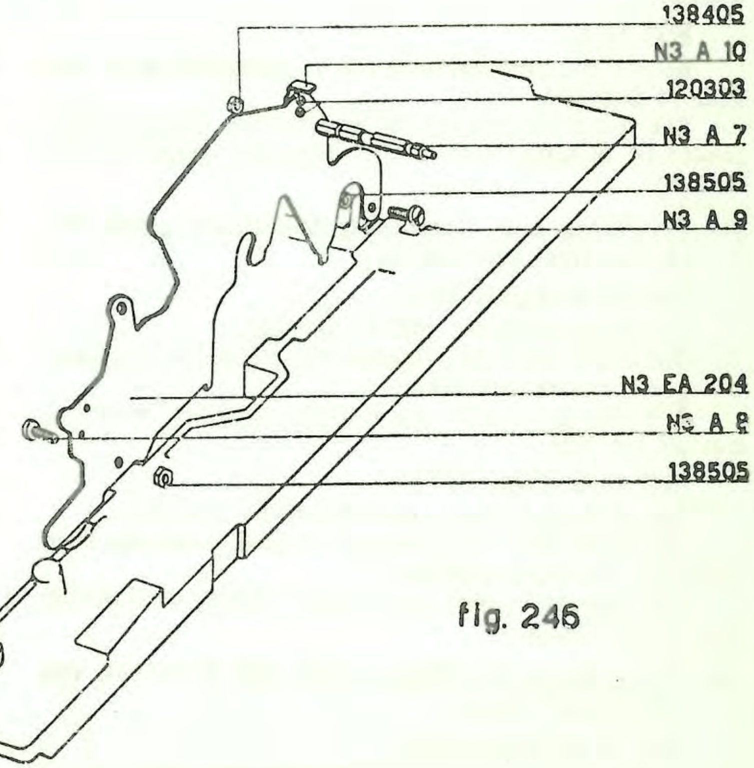


fig. 246

## 6 - Assembling the print unit.

**MC 14 D**

Follow the instructions given in paragraph **6** for the **MC 14 D** (180°).

But the print unit for 36° accumulator Divisumma should be mounted (see « Assembling and adjusting the units »).

**MC 14 E**

Follow the instructions given in paragraph **6** for the **MC 14 D** (180°).

But the print unit for 36° accumulator Elettrosumma should be mounted (see « Assembling and Adjusting the units »).

## 9 - Preparing and assembling the lower guide for the vertical type racks.

**MC 14 D** (Figure 247)

See paragraph **9** for **MC 14 D** (180°).

The comb N3 T 24, although its symbol has not been changed, has been modified.

The rear guide slits are straight instead of widening out on the side.

**MC 14 E** (Figure 247)

See paragraph **9** for the **MC 14 M - E** (180°).

The comb N3 T 24, although its symbol has not been changed, has been modified.

The rear guide slits are straight instead of widening out on the inside.

## 19 - Assembling the front comb N3 D 17 for the horizontal racks.

**MC 14 D** (Figure 248)

Lodge the comb N3 D 17 between the inner sides of the machine taking care that the lever **L** of the negative balance unit is below the comb itself. Clamp the comb with:

— two screw 121262 and a screw 120261 on the right side;
— two screws 121261 on the left side.

Place a washer 40281 under the screw 121262.

Hook the small spring N3 N 21 to the comb N3 D 17.

**MC 14 E**

See paragraph **19** for **MC 14 D** (36°).

Do not hook on the spring N3 N 21.

## 21 - Temporary assembling of the vertical type racks for adjusting the meshing of the gear pinions.

**MC 14 D**

See paragraph **21** for **MC 14 C** (180°).

It is not necessary to use the screw **V** temporarily since there are no stop hooks of the type racks on the print unit.

**MC 14 E**

See paragraph **21** for **MC 14 E** (180°).

It is not necessary to use the screw **V** temporarily since there are no stop hooks of the type racks on the print unit.

## 24 - Assembling the bracket N3 D 18 and the comb for transmission levers N3 D 12.

**MC 14 D - E**

See paragraph **24** for the **MC 14 D - M - E** (180).

The bracket N3 D 18 and the comb N3 D 12 have been modified although their symbols have not been changed. In both of them a hole has been made through the central part.

## 25 - Assembling the tens carry over levers N3 D 6 and the rocker for pull rod N3 EQ 6 for automatic stopping of division.

**MC 14 D - E**

See paragraph **25** for **MC 14 D** (180°).

A screw 120359 should be used in place of the screw 125357 for clamping the plate N3 D 29.

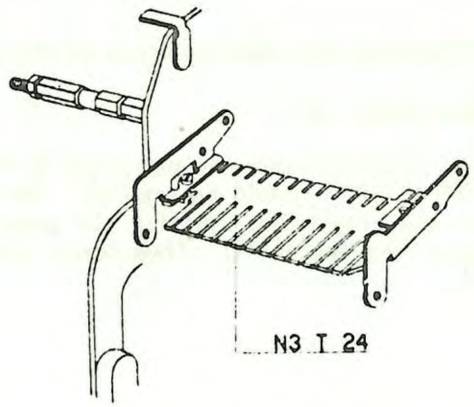


fig. 247

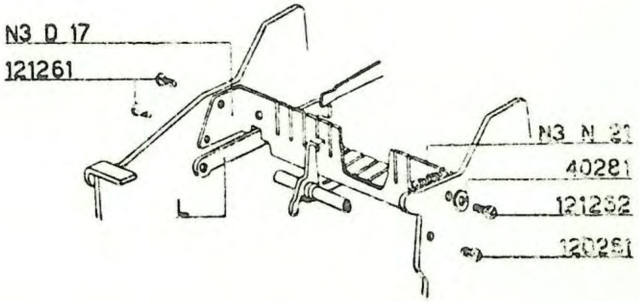


fig. 248

## 29 - Assembling the accumulator.

### MC 14 D - E (Figure 249)

*a*) Place the accumulator frame adjusting plate N3 E 48 in position on the bracket N3 D 18 securing it with a screw 125351, which should only be partially screwed in.

*b*) Put the accumulator unit between the inner sides of the machine as shown in the figure. The right bracket arm should be inserted in the indentation of the plate N3 E 48.

Introduce the shaft N3 E 41 from the right side of the machine; the two bracket arms of the accumulator should pivot on it; make the shaft come out through the corresponding hole in the left inner side of the machine.

*c*) Place the roller carrying arm N3 EE 40 in position, securing it with a screw 125351 (with washer 44372 in between) and two flexible clips 45281.

The screw 125351 should only be partially screwed down.

## 30 - Adjusting the axial position of the accumulator.

### MC 14 D - E

The conditions given in paragraph **30** for the **MC 14 D - M - E** (180°) should be reached. The required conditions are obtained by moving the plate N3 E 48 as necessary (see figure 249). Then screw down the screws 125351.

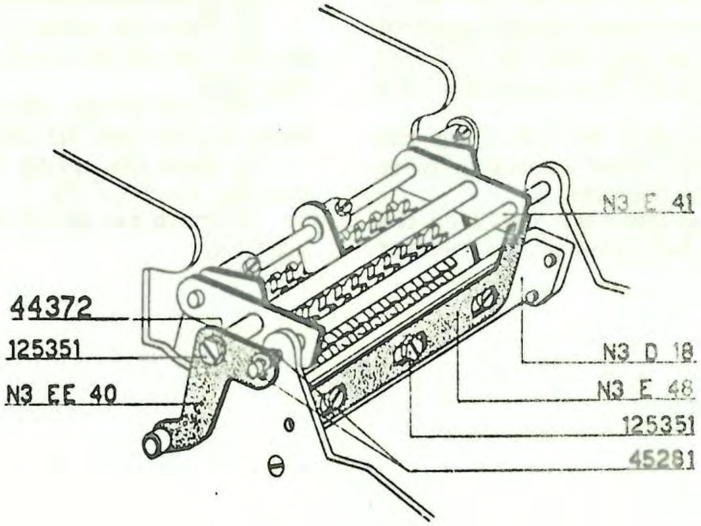


fig. 249

## 31 - Assembling the accumulator meshing control unit.

### MC 14 D - E (Figure 250)

*a*) Attach the shaft N3 H 26 to the left inner side of the machine placing washer 40353 in between.

*b*) Hook the spring of the flexibly coupling N3 E 124 from the anchor to the lever of the unit N3 EH 105.

*c*) Place the cam of the accumulator meshing control group N3 EH 105 in position on the shaft N3 H 26 so that the roller **R** of the arm N3 EE 40 is inserted in the proper slot.

*d*) Lodge the pin carrying disk N3 GH 3 on the anchor plate of the N3 EH 105; place a distance piece N3 H 11 in the central hole of the disk.

*e*) Lodge the anchor raising lever N3 EH 12 on the pin N3 H 37 and also the front arm of the bracket N3 EH 110 and a distance piece N3 H 11.

Screw the pin N3 H 37 onto the side of the machine for the depth of some threads; check that the pin **P** of the lever N3 EH 12 is inserted in the lower slot of the anchor N3 EH 105.

*f*) Insert the screw 1253512 through the upper hole in the bracket N3 EH 110 and through the distance piece N3 H 11 lodged on the disk N3 GH 3.

*g*) Screw down the screw 1253512 and the pin N3 H 37.

*h*) Place the accumulator trip control lever N3 H 8 on the side of the machine, securing it with a flexible clip 45281.

The end of the N3 H 8 should rest on the lower roller of the cam N3 EH 105.

*i*) Hook the spring N3 T 43 between the N3 H 8 and the pin N3 F 10.

*l*) Attach the spring holder 136352 to the side of the machine.

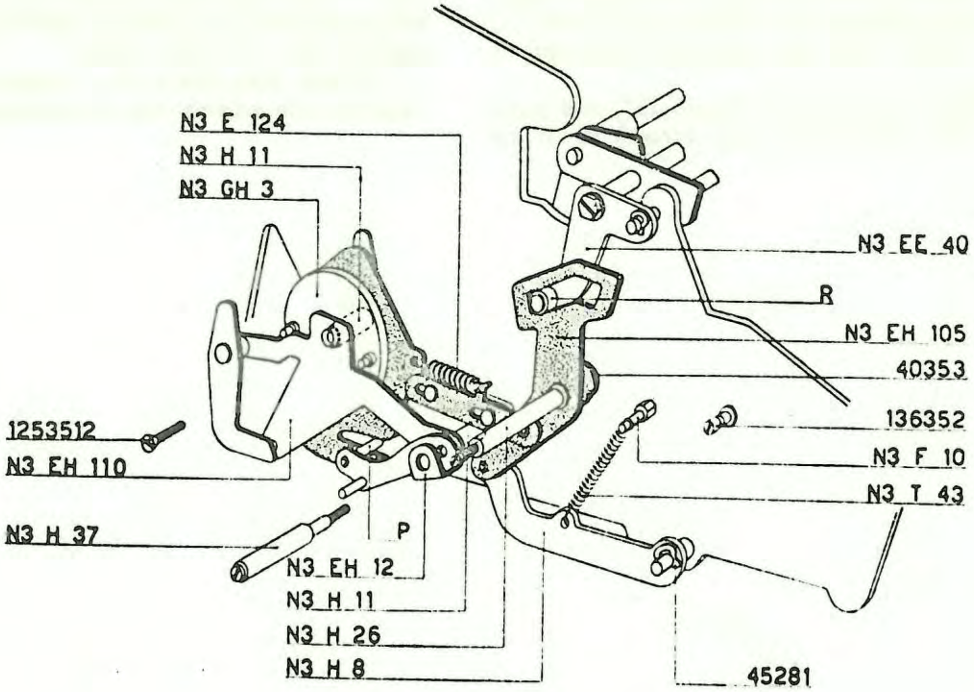

N3 E 124
N3 H 11
N3 GH 3
N3 EE 40
R
N3 EH 105
40353
136352
N3 F 10
N3 T 43
1253512
N3 EH 110
N3 H 37
P
N3 EH 12
N3 H 11
N3 H 26
N3 H 8
45281

fig. 250

## 32 - Adjusting the accumulator meshing.

### MC 14 D - E (Figures 251 - 252)

*a*) Turn the accumulator frame stop plate N3 GE 47 so that it is not in contact with the lock bar **A** (figure 252).

*b*) Bring the accumulator to addition and mesh it, making the cam N3 EH 105 turn towards the front of the machine.

*c*) Loosen slightly the screw **V** (figure 251) and push the accumulator unit downwards (see arrow) so as to obtain the maximum meshing between the wheels and the horizontal racks.

Screw the screw **V** all the way down.

*d*) Bring the plate N3 GE 47 to between the fifth and sixth wheels (starting from the left) of the accumulator. The latter should still be meshed in addition; at this point bring the plate N3 GE 47 to press lightly against the lock bar **A** (figure 252).

Check that there is a maximum play of 0.3 mm between the wheels and the horizontal racks.

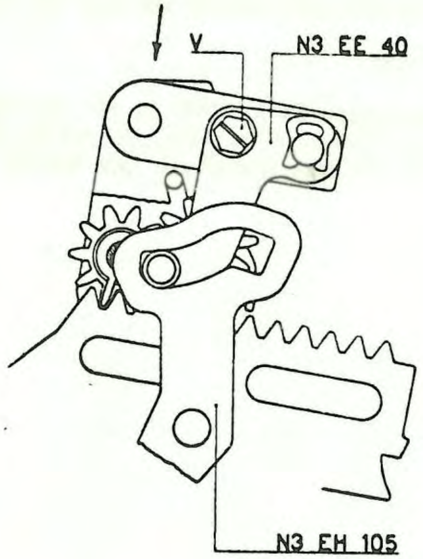


fig. 251

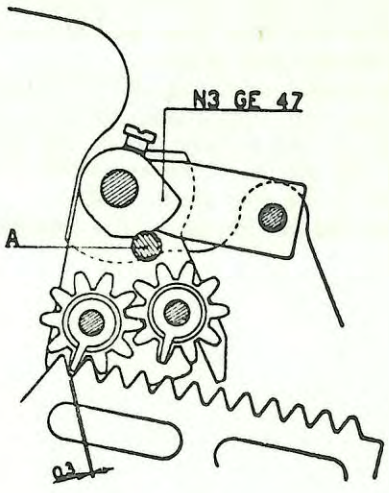


fig. 252

### 33 - Assembling the subtraction control anchor and plate.

**MC 14 D - E** (Figure 253)

*a*) Place the trip lever N3 H 217 in position on the proper pin of the right inner side of the machine securing it with a flexible clip 45361.

Hook a head of spring N3 H 47 to the N3 H 217.

*b*) Place the subtraction control anchor and plate N3 EH 56 on the proper pin of the same side, making sure that the pin **P** of the crank **M** of the accumulator is inserted in the slot of the plate.

Secure the N3 EH 56 with a flexible clip 45281.

### 35 - Assembling the link N3 GG 28 on the inner right side of the machine.

**MC 14 D**

See paragraph 35 for **MC 14 D** (180°).

Naturally the pin $P_1$ of the anchor N3 EH 56 (figure 253) is lodged in the rear slot of the link N3 GG 28.

**MC 14 E**

See paragraph 35 for **MC 14 M - E** (180°).

Naturally the pin $P_1$ of the anchor N3 EH 56 (figure 253) is lodged in the rear slot of the link N3 GG 28.

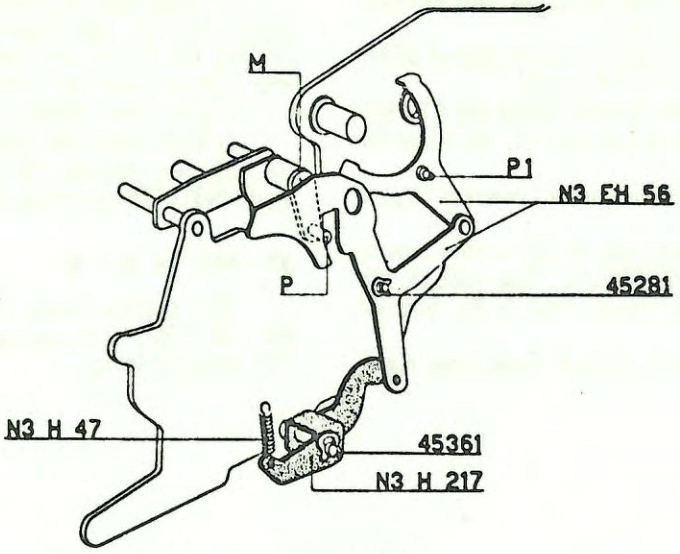


fig. 253

## 36 - Assembling the ribbon lift arms and the double print control hook N3 ET 131.

**MC 14 D - E** (Figures 254 - 255)

*a*) Introduce the ribbon lift control shaft N3 L 25 in the proper hole in the left inner side of the machine (figure 254) and make it come out through the corresponding hole in the right inner side.

*b*) On the right of the shaft lodge in order (figure 254):

— a washer 40506 (not seen in the figure);

— the left bend of the double print control hook N3 ET 131;

— the right ribbon lift control crank N3 EL 27 with its screw 120302;

— the right bend of the double print control hook N3 ET 131.

*c*) Place the pin of the crank N3 EL 27 in the lower hole of the right ribbon lift N3 GL 24. The ribbon lift should be guided above by the column N3 A 7. Secure it with a flexible clip 45221.

*d*) The shaft N3 L 25 should project from the right bend of the double hook N3 ET 131 for the depth of its bevel. Bring the crank N3 EL 27 against the side and screw in partially its screw 120302 (figure 254).

*e*) Lodge the ribbon lift control crank N3 EL 126 on the left of the shaft N3 L 25 (figure 255). Bring it against the side; allow the shaft N3 L 25 an axial play of 0.2 mm. Screw in the screw 120302 partially.

*f*) Place the distance piece 40316 on the pin of the crank N3 EL 126 (figure 255) and then the left ribbon lift N3 GL 23 at the same time lodging its upper slot on the proper seat on the column N3 A 6.

Secure the ribbon lift with a flexible clip 45221.

*g*) Raise the two ribbon lifts N3 GL 23 and N3 GL 24; fix the two cranks N3 EL 126 and N3 EL 27 onto the shaft N3 L 25 screwing down their screws 120302.

## 37 - MC 14 D - E

The pieces listed in paragraph 37 for **MC 14 D - M - E** (180°) are not used on the **MC 14 D - E** with 36° accumulators.

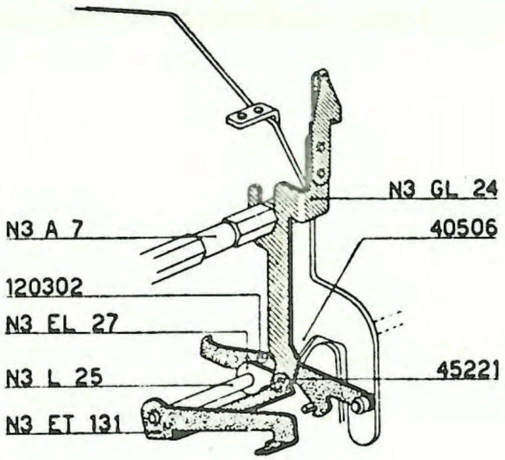


fig. 254

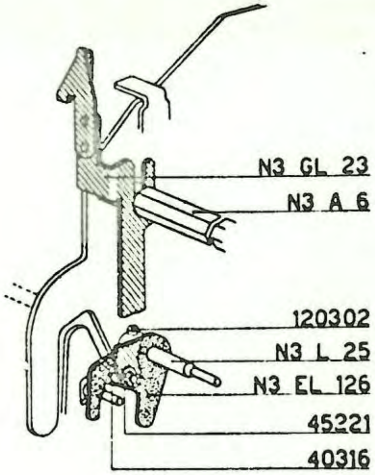


fig. 255

## 38 - Assembling the jaws for the ribbon advance N3 EL 18.

### MC 14 D - E (Figure 256)

See paragraph 38 for MC 14 D - M - E (180°).

The jaws for the ribbon advance N3 EL 18 have been modified although their symbol has not been changed. Their front point has been slightly tapered.

## 40 - Assembling the accumulator control lever N3 EH 1.

### MC 14 D - E (Figure 257)

See paragraph 40 for MC 14 D (180°).

The shape of the N3 EH 1 has been changed as is shown in figure 257.

The small spring N3 T 45 is hooked between the shank **A** of the link **B** and the corresponding spring holder.

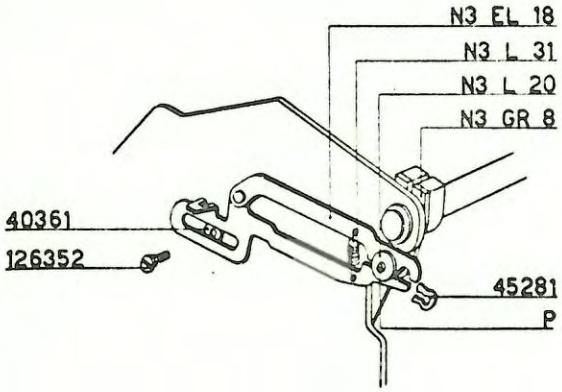


fig. 256

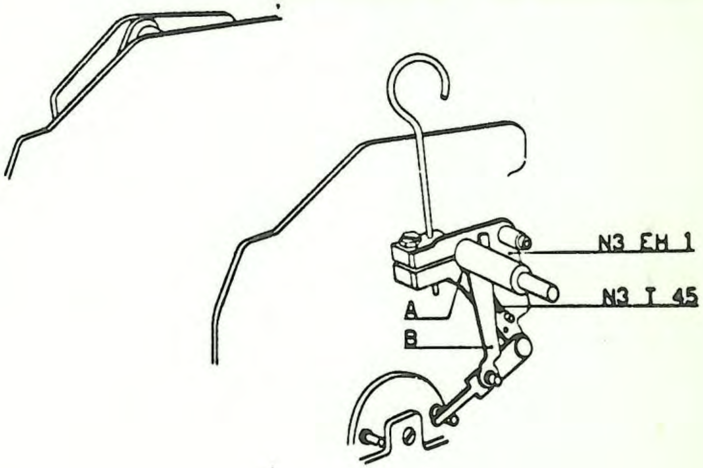


fig. 257

## 48 - Assembling the alignment unit and the motor wheels unit.

### MC 14 D - E (Figures 258 - 259)

*a*) Place the alignment unit in position between the inner sides so that:

— its left bend is lodged on the tapered point of the screw N3 A 26 (figure 258);

— the hooks **G** are inserted in the corresponding guide slits of the comb N3 T 24 (figure 258);

— the same hooks **G** take the position shown in figure 259 in relation to the frame N3 GT 220;

— the roller **R** of the double print hook N3 ET 131 is inserted in the right slot.

*b*) Assemble the motor wheels unit according to the instructions given in paragraph 48 for **MC 14 D - M - E** with 180° accumulator.

Make sure that the pin **P** of the motor wheels bracket (figure 258) is inserted in the hole in the right bend of the alignment unit. The latter is consequently guided by the pin **P** and the screw N3 A 26.

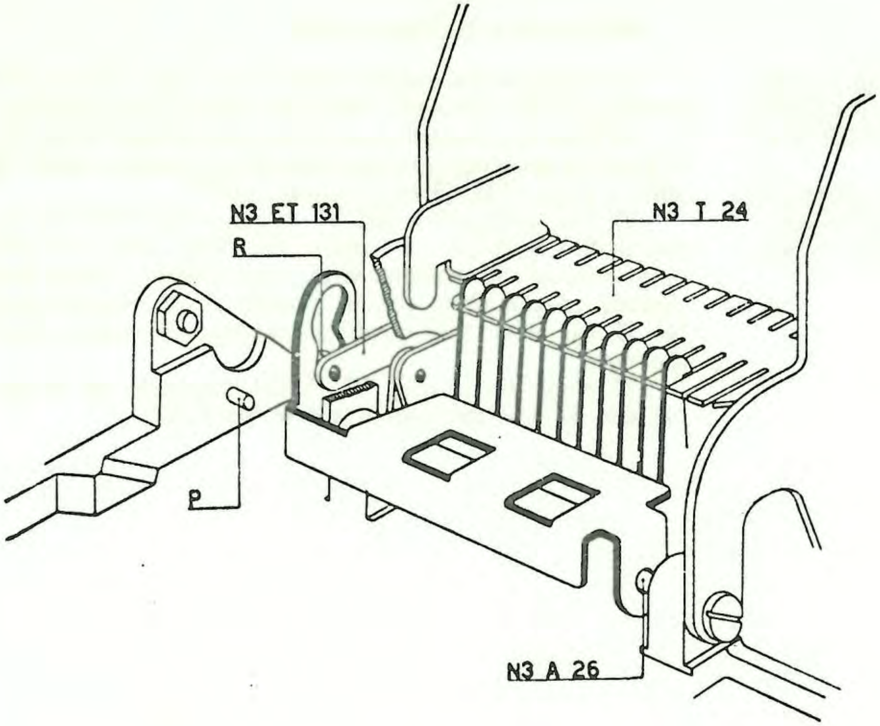


fig. 258

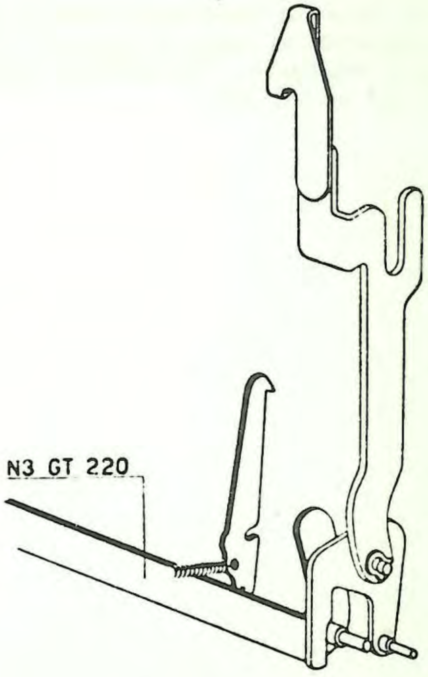


fig. 259

### 50 bis - Adjusting the position of the nines stop plate N3 D 28.

**MC 14 D - E** (Figure 260)

*a*) Bring the horizontal racks to zero position; to do this it is only necessary for the racks **D** to be in contact with the corresponding transmission hooks N3 GD 4 as shown in the figure.

*b*) Move the nines stop plate N3 D 28 by means of the eccentrics as required so as to obtain the distance given in the figure. The condition should obtain on the right and on the left.

### 55 bis - Assembling the transmission lever lock bridge N3 GH 57.

**MC 14 D - E** (Figure 261)

*a*) Unscrew the upper screw on the right holding the bracket N3 D 18 to the left inner side of the machine.

*b*) Place the transmission levers lock bridge N3 GH 57 in position securing it to the right of the bracket N3 D 18 with a screw 125359 and its nut 138351.

*c*) The bridge N3 GH 57 is guided on the left by the shaft N3 H 29. So screw the latter onto the left inner side of the machine with a nut 138351. Only two threads of the shaft should project from the bracket N3 D 18; when this condition is reached screw down the nut.

*d*) Hook the spring N3 M 121 between the bridge N3 GH 57 and the special screw N3 F 10.

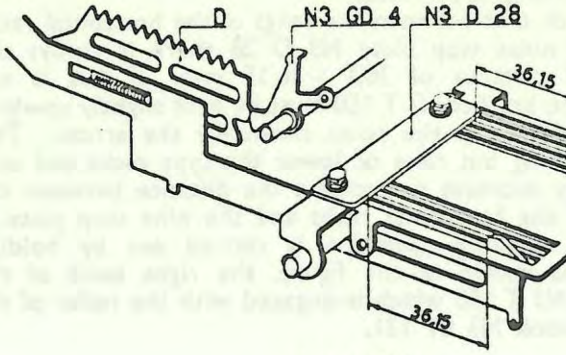


fig. 260

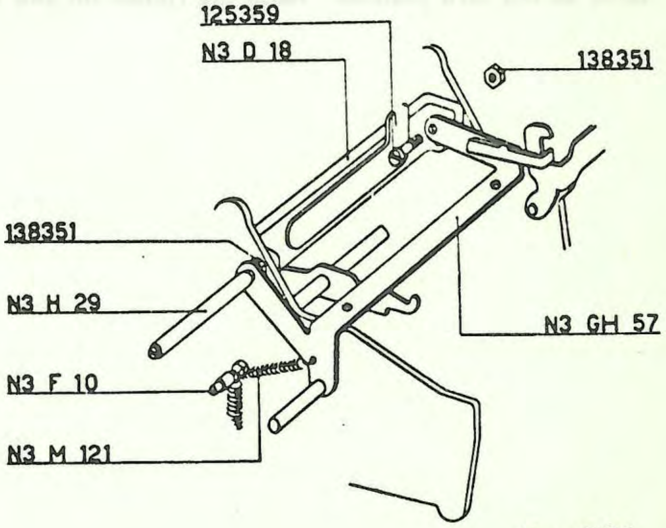


fig. 261

## **56 bis - Assembling the type racks and adjusting the alignment unit.**

### MC 14 D - E (Figure 262)

*a*) Operate the machine by and until the special signs horizontal rack stops. Check that the latter and the eleven calculating racks are aligned. Lock the motor wheels with a screw driver so that they do not move from the position reached.

*b*) Assemble the type racks as described in paragraph **113** for **MC 14 D** (180°).

*c*) Bring the machine back to the normal position.

*d*) Operate the machine by hand and make the racks come to the zero position. Raise the ribbon lift and turn completely upwards the double print control hook N3 ET 131. The hooks N3 T 219 hook onto the corresponding type racks.

Check that between the tangs of the horizontal racks and the nines stop plate N3 D 28 there is always the required distance of 36.1 ÷ 36.15 mm. If this is not found, the bracket N3 T 150 must be bent slightly upwards or downwards at the point shown by the arrow. This does nothing but raise or lower the type racks and consequently decrease or increase the distance between the tangs of the horizontal racks and the nine stop plate.

The bending operation is carried out by holding firmly, as shown in the figure, the right bend of the bracket N3 T 150 which is engaged with the roller of the double hook N3 ET 131.

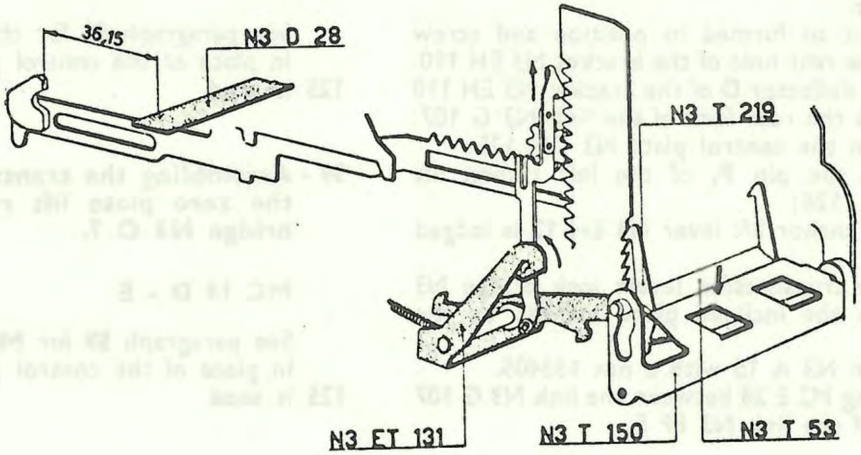


fig. 262

## 57 - Assembling the control plate N3 GH 125 and the non add control link N3 G 107.

**MC 14 D - E** (Figure 263)

*a*) On the pin N3 A 15 lodge in order:
— the rear slot of the control plate N3 GH 125;
— the special distance piece N3 H 41;
— the rear slot of the non add control link N3 G 107;
— the washer 40425.

*b*) Place the unit so formed in position and screw the pin N3 A 15 in the rear hole of the bracket N3 EH 110.

*c*) The pin of the deflector **D** of the bracket N3 EH 110 should be inserted in the rear fork of the link N3 G 107.

*d*) Check that on the control plate N3 GH 125:
— the fork **1** lodges the pin $P_1$ of the left ribbon lift control crank N3 EL 126;
— the pin $P_2$ of the anchor lift lever N3 EH 12 is lodged in slot **2**;
— the pin $P_3$ of the transmission levers lock bridge N3 GH 157 comes onto the inclined plane marked by the arrow.

*e*) Secure the pin N3 A 15 with a nut 138405.

*f*) Hook the spring M2 E 28 between the link N3 G 107 and the stop hook of the link N3 EF 5.

## 58 - Assembling the support bracket N3 EG 18.

**MC 14 D**

See paragraph **58** for **MC 14 D** (180°).
However, in place of the control plate N3 GH 25 the N3 GH 125 is used.

**MC 14 E**

See paragraph **58** for the **MC 14 M - E** (180°).
In place of the control plate N3 GH 25 the N3 GH 125 is used.

## 59 - Assembling the transmission bridge N3 EG 12, the zero plate lift rocker N3 N 38 and the bridge N3 O 7.

**MC 14 D - E**

See paragraph **59** for **MC 14 D - M - E** (180°).
In place of the control plate N3 GH 25 the N3 GH 125 is used.

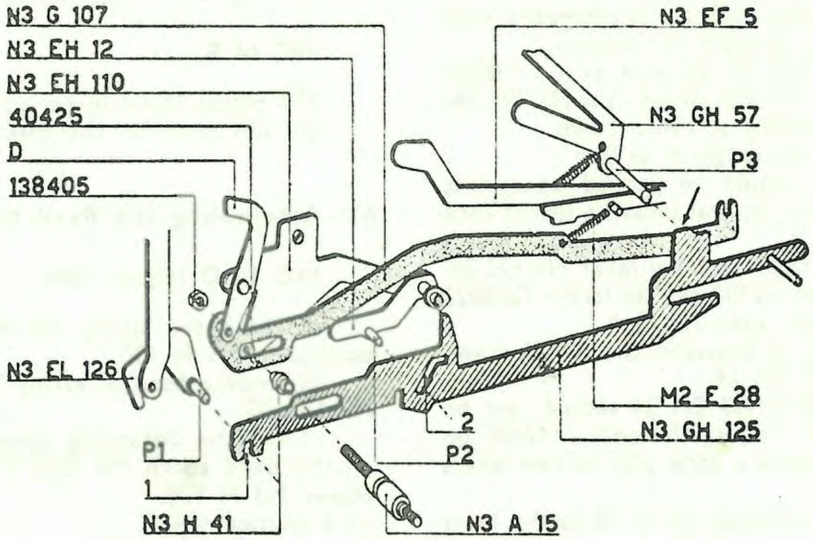

N3 G 107
N3 EH 12
N3 EH 110
40425
D
138405
N3 EL 126
P1
1
N3 H 41
N3 EF 5
N3 GH 57
P3
M2 E 28
N3 GH 125
2
P2
N3 A 15

fig. 263

### 61 - Assembling the ovoid cam N3 GH 22 - Roller holding lever for cam N3 EH 24 and the motor hook shut off lever N3 G 4.

**MC 14 D - E** (Figure 264)

*a*) Lodge the ovoid cam N3 GH 22 and the collar 142517 with its screw 120262 on the shaft N3 H 26. Clamp the collar on the shaft so that the cam is allowed a very slight axial play and perfect freedom of rotation.

*b*) Place the special pin N3 H 128 with its nut 138261 on the roller holding lever for the ovoid cam N3 EH 24; the nut should only be partially screwed down.

*c*) On the shaft N3 H 29 lodge in order:

— the collar 40409 which should be pushed up against the nut so that it can guide the transmission levers lock bridge N3 GH 57;

— the unit formed by the roller holding lever N3 EH 24, the washer 40402, the collar 142401 and its screw 1253022 and the motor hook shut off lever N3 G 4.

Hook the spring N3 V 52 between the N3 G 4 and the roller holding lever N3 EH 24.

*d*) The roller of the lever N3 EH 24 should rest on the edge of the ovoid cam. Adjust the collar 142401 on the pin N3 H 29 so as to leave a little play to the levers N3 EH 24 and N3 G 4.

*e*) Hook the head of the spring N3 H 48 to the lever N3 EH 24.

### 62 - Assembling the rocker for hooking the main lever N3 Q 30.

**MC 14 D** (Figure 264)

*a*) Hook a head of the spring N3 M 121 to the rocker N3 Q 30.

*b*) Lodge the rocker on the pin N3 H 29.

**MC 14 E**

The pieces listed in paragraph **62** for **MC 14 D** (35°) are not used on the Elettrosumma.

### 63 - Assembling the fixed tooth N3 GQ 27.

**MC 14 D** (Figure 264)

*a*) Hook the spring N3 H 48 to the control plate positioner N3 H 130.

*b*) Hook a head of spring N3 H 6 to the fixed tooth N3 GQ 27.

*c*) On the distancing column N3 A 15 lodge:

— the fixed tooth N3 GQ 27 and, astride it, the positioner N3 H 130.

— a washer 40461.

**MC 14 E**

*a*) Hook the spring N3 H 48 to the control plate positioner N3 H 130 and lodge the latter in the corresponding guide groove of the column N3 A 15 (figure 264).

*b*) Place the washer 40461 on the column N3 A 15 (figure 264).

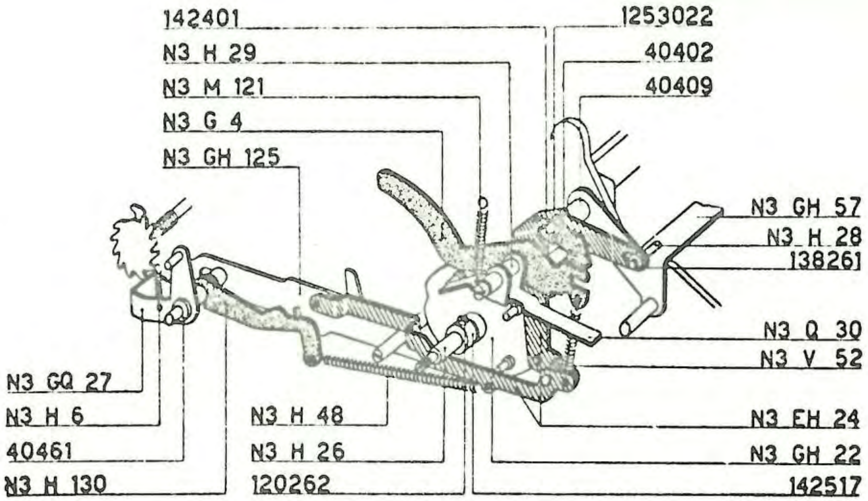

142401
N3 H 29
N3 M 121
N3 G 4
N3 GH 125
1253022
40402
40409
N3 GH 57
N3 H 28
138261
N3 Q 30
N3 V 52
N3 GQ 27
N3 H 6
40461
N3 H 130
N3 H 48
N3 H 26
120262
N3 EH 24
N3 GH 22
142517

fig. 264

## 64 - Preparing the left outer side N3 A 2.

### MC 14 D (Figure 265)

See paragraph 64 for **MC 14 D** (180°).

In place of the lever for control plate N3 GH 36, the N3 H 136 is used. The pin N3 H 50 is lodged on this and secured with a flexible clip 45221.

### MC 14 E (Figure 265)

See paragraph 64 for **MC 14 M - E** (180°).

In place of the lever for control plate N3 GH 36, the N3 H 136 is used. The pin N3 H 50 is lodged on this and secured with a flexible clip 45221.

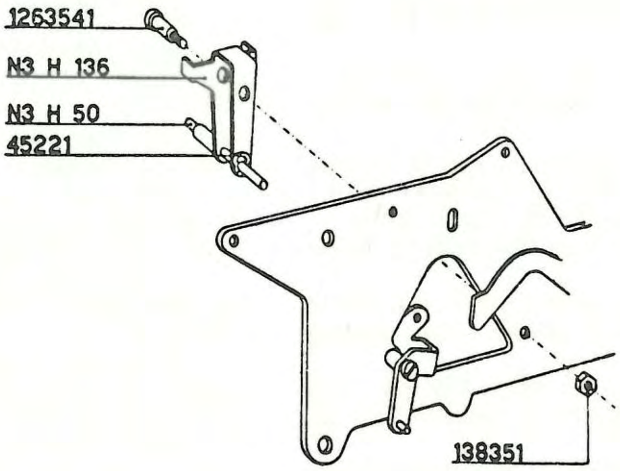


fig. 265

## 65 - Assembling the left outer side.

### **MC 14 D** (Figures 266 - 267 - 268 - 269 - 270)

Place the left outer side of the machine in position taking care that:

*a*) the sides connecting column N3 A 6, the distancing column N3 A 15, the pin N3 H 29 and the pin N3 H 37 are lodged in the corresponding guide holes in the side itself (see figure 70 - assembling **MC 14 D** - 180° accumulator);

*b*) the spring N3 M 121 of the rocker N3 Q 30 is turned upwards (see figure 70 - assembling **MC 14 D** - 180° accumulator);

*c*) the tapered point of the special pin N3 Q 26 goes and enters in the hole in the end of the shaft of the quotient accumulation wheel N3 GQ 38 (figure 266);

*d*) the main lever with rollers is in the position shown in figure 267;

e) the pin **P** of the control anchor lever N3 EH 34 is inserted in the hole in the end of the roller holding lever N3 EH 24 (figure 268);

*f*) the lower part of the anchor lever N3 EH 24 is in the position shown in the figure in relation to the pin N3 H 37;

*g)* the pin **P** of the control plate lever N3 H 136 is above the positioner N3 H 130 and also inserted in the proper slot **A** of the control plate N3 GH 125 (figure 269).

When these conditions have been reached, place the guide square N3 Q 19 in position on the outer side (see figure 70 - assembling **MC 14 D** - 180° accumulator); clamp the side to the base of the machine with:

— two screws N3 A 9 and their nuts 138505;

— two nuts 138405 which should be screwed on the distancing column N3 A 15 and the pin N3 H 26.

Hook the spring N3 H 6 to the quotient accumulation pull rod shut off tooth N3 GQ 28 (figure 270).

### **MC 14 E**

Place the left outer side in position on the machine so that:

*a*) the sides connecting column N3 A 6, the distancing column N3 A 15, the pins N3 A 29, N3 H 37 and N3 H 26 are lodged in the corresponding guide holes in the side itself (see figure 71 - assembling **MC 14 M - E** - 180° accumulator);

*b*) the pin **P** of the control anchor lever N3 EH 34 is inserted in the hole in the end of the roller holding lever N3 EH 24 (figure 268);

*c*) the lower part of the anchor lever N3 EH 34 is in the position shown in figure 268 in relation to pin N3 H 37;

*d*) the pin **P** of the control plate lever N3 H 136 is above the positioner N3 H 130 and also inserted in the proper slot **A** of the control plate N3 GH 125 (figure 269).

When these conditions have been reached, clamp the side to the base of the machine with (see figure 71 - assembling **MC 14 M - E** - 180° accumulator);

— two screws N3 A 9 with their nuts 138505;

— three nuts 138405 which are screwed respetively on the distancing column N3 A 15, the pin N3 H 26 and the column N3 A 6.

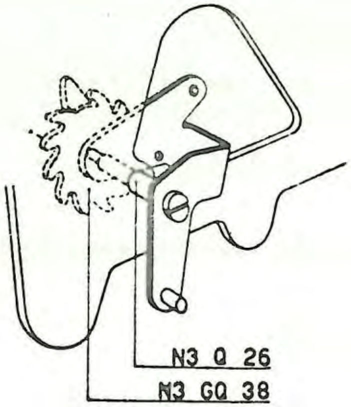


fig. 266

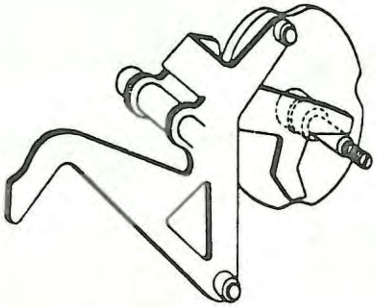


fig. 267

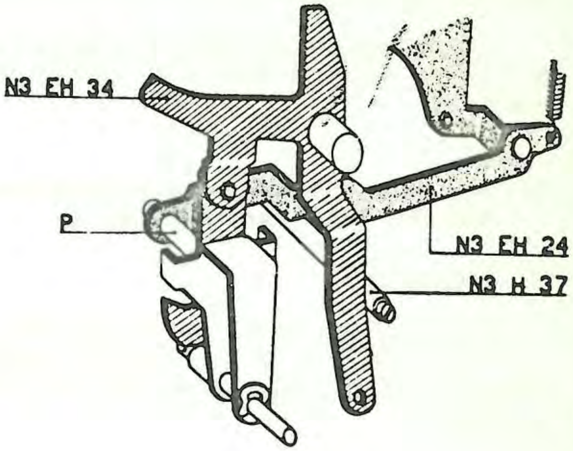


fig. 268

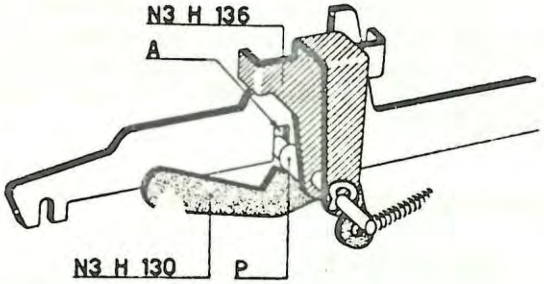


fig. 269

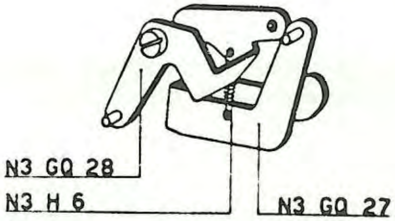


fig. 270

## 68 - MC 14 D - E

The adjustment described in paragraph 68 for MC 14 D - M - E does not have to be carried out (180° accumulator).

## 79 - Adjusting the feeler cam control arm N3 GQ 36 and the feeler cam N3 GQ 14.

### MC 14 D

See paragraph 79 for MC 14 D (180°).
The right bend of the indicator bridge N3 EQ 33 must rest on the edge of the cam N3 EH 56 (see figure 253).

### MC 14 E

See paragraph 79 for MC 14 M - E (180°).

## 113 - MC 14 D

The operation described in paragraph 113 for MC 14 D (180°) has already been carried out.

### MC 14 E

The operation described in paragraph 113 for MC 14 M - E (180°) has already been carried out.

## 118 bis - Assembling the speed reducing link N3 V 71.

### MC 14 D - E (Figure 271)

Connect the control plate lever N3 H 136 with the lever L of the motor unit by means of the speed reducing link N3 V 71.
Secure the link with three flexible clips 45221.

## 140 bis - Adjusting the position of the type rack stop hooks.

### MC 14 D - E (Figure 272)

Clear the accumulator.
Enter a series of 1s and operate the machine in addition.
Make the platen return a pitch and obtain a grand total.
The numbers printed in red should be on top of or slightly higher than those printed in black.
When the difference, on the whole printing plane, is appreciable, it is a sign that the adjustment described in paragraph 56 bis has not been carried out accurately.
If the difference is only appreciable for some columns, the high of the pins G must be corrected.
The required condition is obtained through adjusting the teeth of the comb N3 T 53 with the special tool UA 8047/1x4.

## 142 - Adjusting motor speed.

### MC 14 D - E

Adjust the speed of the motor so that the machine makes 150 strokes a minute.

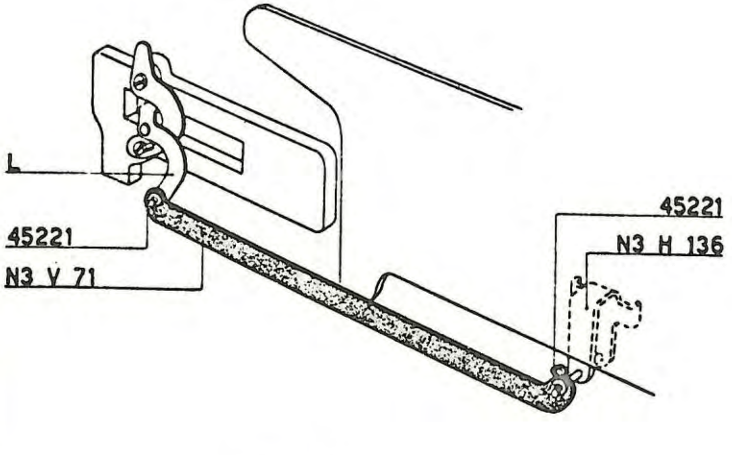


fig. 271

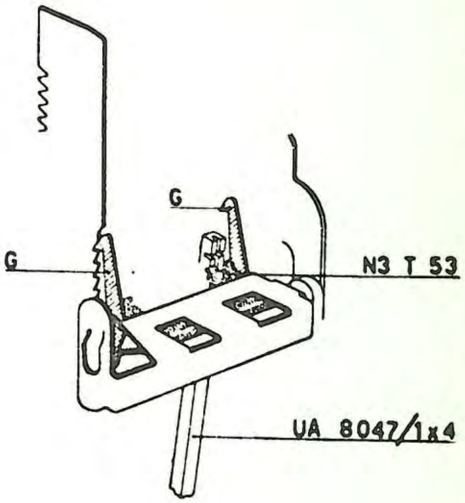


fig. 272

# Instructions for Assembly and Adjustment of the units

## MC 14 D - E (36· accumulator)

The carriage, horizontal racks, type racks, multiplier, ribbon holder, slide and keyboard units are identical with those in the machines with 180° accumulators.

### Preparing the motor wheels unit.

See the instruction given for preparing the motor wheels unit for the 180° accumulator machines.

The motor wheels bracket, although its symbol has not been changed, has been modified. A pin which guides the line spacing unit has been mounted on it (see assembling the machine).

## Preparing the alignment unit.

### MC 14 D - E (Figure 273)

*a*) Lodge the hooks N3 T 219 in the closed slots of the comb N3 T 53.

Hook the springs N3 D 16 between the hooks and the comb.

*b*) Attach the unit prepared in *a*) on the bridge N3 T 150 with three screws 125306 which should only be partially screwed down.

c) Move the comb N3 T 53 as required so as to allow the hooks a minimum play which gives them complete freedom to rotate.

When these conditions have been reached screw down the three screws 125306.

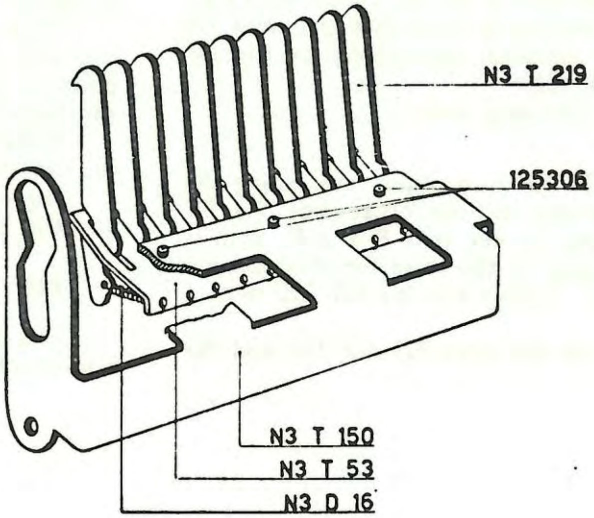


fig. 273

## Preparing the print unit.

### MC 14 D (Figure 274)

See the instructions given for the preparation of the print unit for the 180° accumulator - Divisumma.

The operations described in *a*), *b*), *c*), *d*), *e*), *f*), *g*), should be carried out bearing in mind that the sides N3 GT 2 and N3 T 1 are replaced respectively by the N3 GT 202 and the N3 GT 101.

Then go on in the following order:

*h*) Figure 274

Place the side N3 GT 101 in position interposing the frame N3 GT 220 betweenit and the other side N3 GT 202. The frame is guided by the pins **P** and $\mathbf{P_3}$ and its pins **H** and $\mathbf{H_1}$ are lodged in the slots for the purpose in the sides themselves. Secure the N3 GT 220 with a flexible clip 45361.

Attach the pieces on the sides N3 GT 101 and N3 GT 202 following the instructions given for assembling the print unit of the 180° accumulator - Divisumma.

*i*) Figure 274

Hook the spring N3 T 42 between the pin $\mathbf{P_1}$ of the N3 GT 220 and the pin $\mathbf{P_2}$ of the side N3 GT 202.

*l*) Figure 275

Place the hook N3 GM 536 on the proper pin **P** of the side N3 GT 101; its front shank should take the position shown in the figure in relation to the pin of the hammer segment N3 GQ 15.

Mount the spring holder 136353 with its nut 138351 on the side N3 GT 101.

Hook the spring N3 T 45 between the spring holder and the hook N3 GM 536.

### MC 14 E

The hook N3 GM 536 is not used and so the spring holder 136353 is not required either.

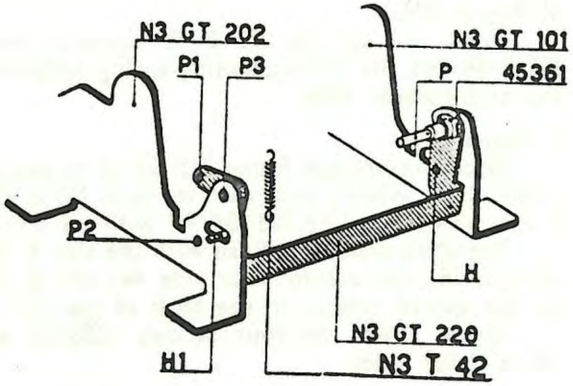


fig. 274

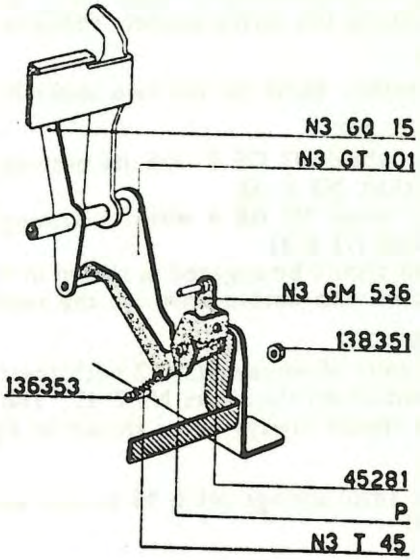


fig. 275

## Preparing the 36° accumulator unit.

### MC 14 D - E

*a*) Figure 276

On the left accumulator side N3 GE 36 S clamp the two shafts for the accumulator wheels N3 E 43 with the nuts 138305, placing the spring washers 44332 in between.

*b*) Figure 276

Lodge a washer 40355 on the two shafts N3 E 43.

c) Figures 276 - 277

Lodge the wheel N3 GE 3 with its bushing N3 E 42 on the front shaft N3 E 43.

Lodge the wheel N3 GE 4 with its bushing N3 E 42 on the rear shaft N3 E 43.

The wheels should be engaged as shown in figure 277. The teeth shown with dotted lines are the return teeth.

*d*) Figures 276 - 277

Place ten pairs of wheels N3 E 2 with their bushings N3 E 26 in position on the shafts N3 E 43. The engaging of the wheels should always be as shown in figure 277.

e) Figure 276

Lodge the small springs N4 E 15 on the ends of the shafts N3 E 43.

*f*) Figure 276

Place the lock bar N3 E 44 in position as shown in the figure.

Its tapered ends should be lodged in the proper guide slots of the accumulator sides.

*g*) Figure 276

Place the right side of the accumulator N3 GE 36 D in position securing it with the nuts 138305 and placing the spring washer 44332 in between.

The nuts should only be partially screwed down.

*h*) Figure 276

Hook the springs N3 E 35 between the lock bar N3 E 44 and the corresponding spring holders rivited on the accumulator sides.

*i*) Figure 278

Place the bracket frame N3 GE 38 in position on the accumulator wheels unit with its shaft N3 E 45 on which is mounted the plate N3 GE 47 with its screw 1253022.

The shaft should be flush with the side F of the frame N3 GE 38; the accumulator side N3 GE 36 S is guided by the special groove in the shaft of the N3 GE 38.

Screw down the four screws 1253022 of the two accumulator sides.

*l*) Screw down the four nuts 138305 which hold the accumulator wheels shafts all the way. Check that the wheels are free to rotate and have a slight axial play.

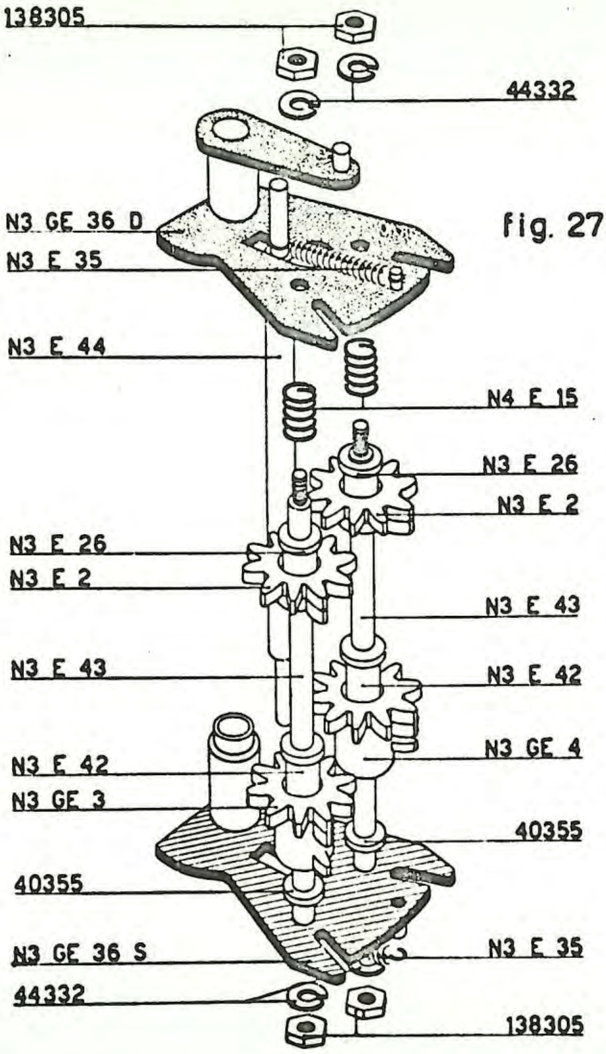


fig. 276

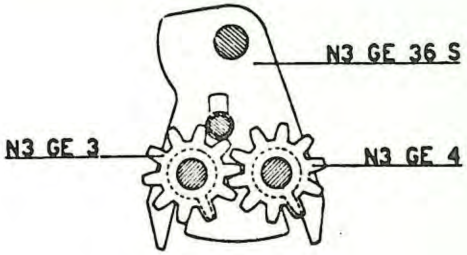


fig. 277

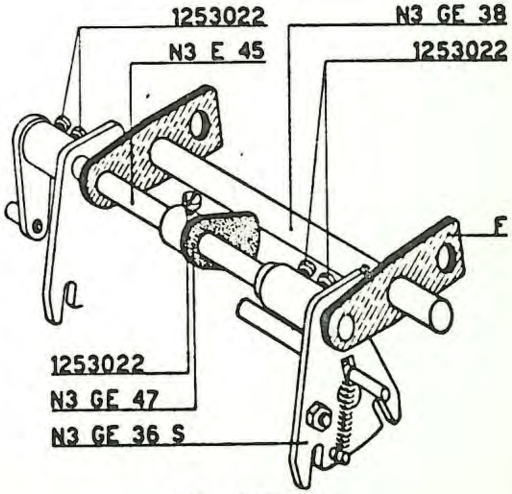


fig. 278

# Hand control for back spacing the slide

Beginning with serial number 415601 for Elettrosumma, 516101 for Multisumma and 821601 for Divisumma a device for back spacing the slide has been mounted on the machines.

It has been necessary, for reasons of space, to modify some parts, i.e.:

N3 EB 50 — Upper keyboard plate. — On this the rear left corner has been reduced.

NE GG 42 — Correction key control lever. — The length of the bridge has been shortened to leave room for the small shaft of the back space control key N3 GG 62.

N3 GG 13 — Non print bridge.

These parts have not changed their symbols and starting with the serial numbers mentioned, will be made in this manner and can replace the previous ones; so they are interchangable.

The bodies have been altered; a slot has been made through which the slide back space control key can project.

From N3 AW 1 for Elettrosumma, it has changed to the N3 AW 101.

From N3 AM 105 for Multisumma and Divisumma it has changed to N3 AM 505.

It is also necessary to place on the slide, also for the Elettrosumma machines, the rack N3 Q 18 (see « Assembly and adjustments of units for **MC 14** with 180° accumulator »); the stop plate N3 C 19 is placed on the left bracket of the escapement N3 I 7. The two pieces are secured with screws 125352 (figure 279).

### MC 14 D (Figures 280 - 281 - 282)

*a*) Figure 280

The slide advance pull rod N3 Q 20 has been replaced by the N3 GQ 20; the pin **P** has been added to this.

*b*) Figure 280

The back space control key N3 GG 62 must be mounted on the shaft N3 G 14 after the correction key N3 GG 42 is already in place. To facilitate the assembly, the latter must be slipped out of its guide N3 G 9 and the front part raised.

Place the washer 40463 between the left outer side of the machine and the left bend of the key N3 GG 62.

The lower shank of the key N3 GG 62 must be in front of the pin **P** of the pull rod N3 GQ 20.

*c*) Figure 280

Hook the spring N3 G 51 between the pin of key N3 GG 62 and the rocker and bracket unit N3 EQ 84.

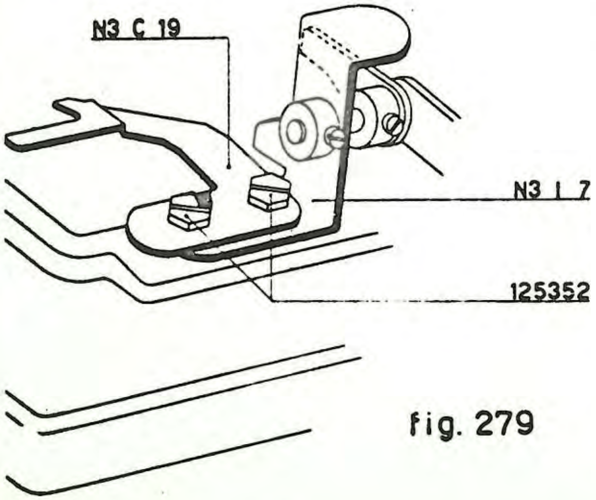


fig. 279

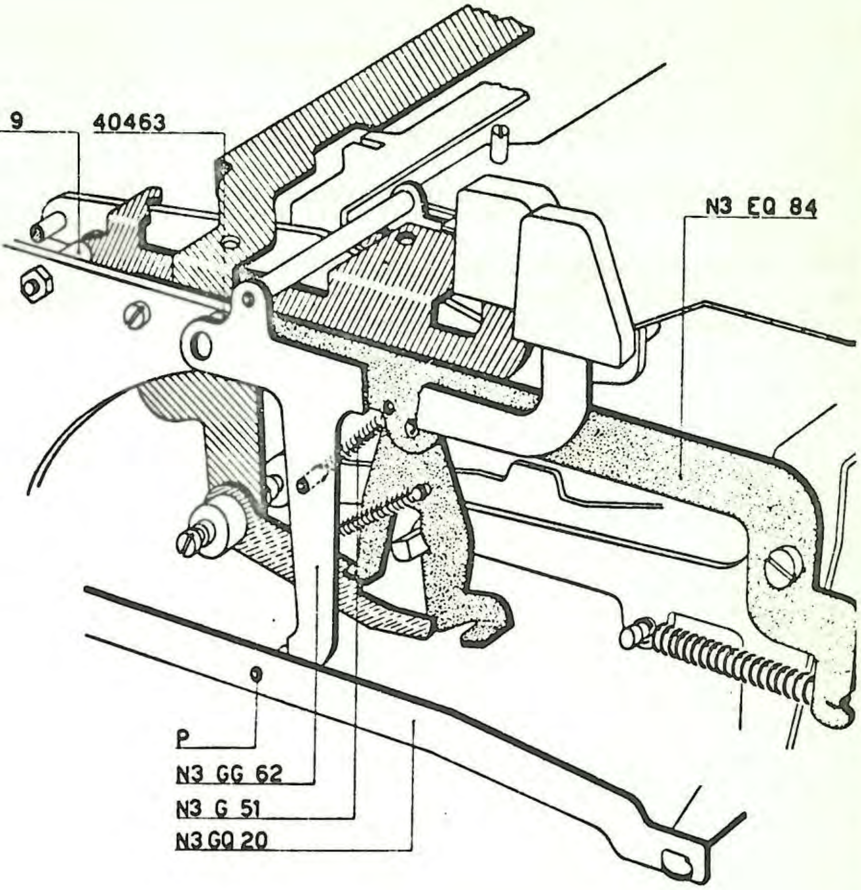


fig. 280

d) Figure 281

The shaft N3 G 14 is held by three flexible clips 45281 which are placed respectively:

— on the outside of the key N3 GG 62;

— between the washer 40463 and the left outer side of the machine;

— between the bridge N3 GQ 23 and the correction key.

e) Figure 282

After having adjusted the slider back space during division by the usual methods, check the return « by hand » of the slide itself. Proceed as follows:

— enter any three numbers;

— lower the slide back space key slowly and push the tooth N3 EQ 17 towards the back of the machine.

In this way the tooth D can enter in the third space in the rack N3 Q 18.

When the pin P stops at the bottom of the slot of the N3 C 19, the tooth D should not in any way move the rack N3 Q 18.

At the maximum it should brush it or be 0.1 ÷ 0.2 mm away from it.

These conditions are reached by moving the N3 C 19.

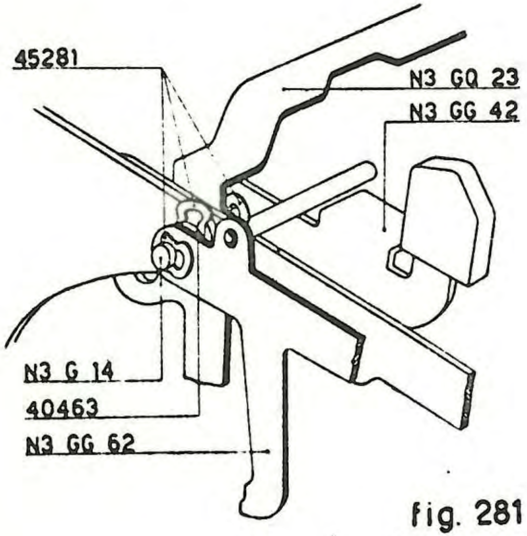


fig. 281

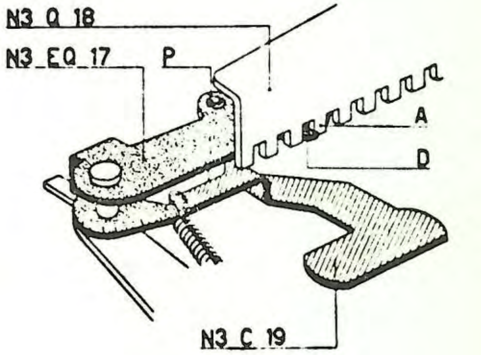


fig. 282

**MC 14 E** (Figure 283)

The figure shows all the pieces necessary for the back spacing of the slide by hand.

The adjustment should be carried out as explained in the preceding paragraph (for **MC 14 D**) after having moved the N3 EQ 17 half way along the slot of the N3 Q 42.

# PART THREE

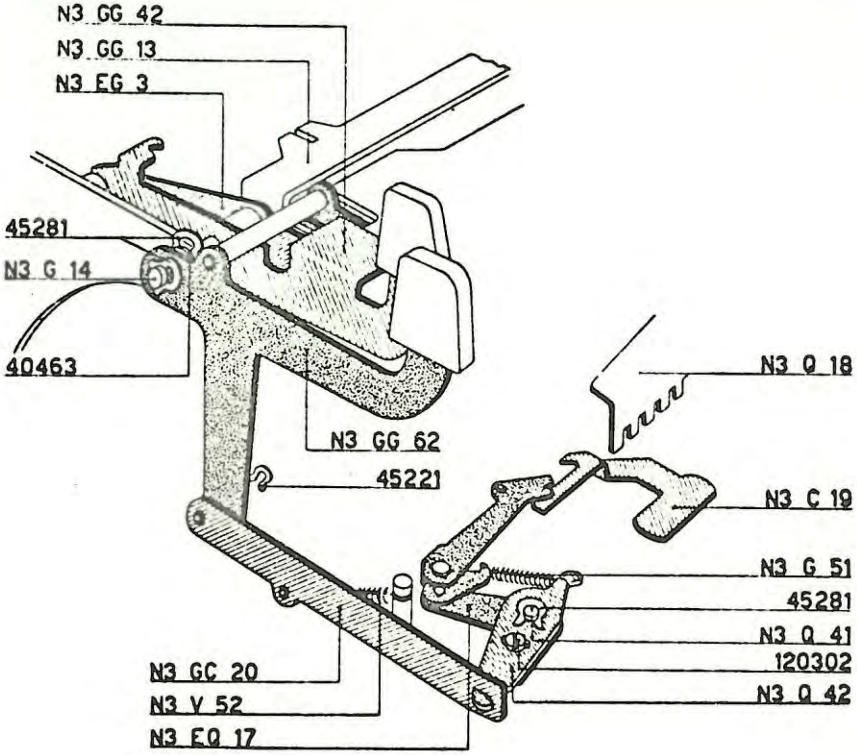

N3 GG 42
N3 GG 13
N3 EG 3
45281
N3 G 14
40463
N3 GG 62
45221
N3 Q 18
N3 C 19
N3 G 51
45281
N3 Q 41
120302
N3 Q 42
N3 GC 20
N3 V 52
N3 EQ 17

fig. 283

# Maintenance

## Maintenance.

The maintenance of the **MC 14** includes the general cleaning of the machine and the lubrication of some of the parts.

Proceed as follows:

*a*) Remove the hand knob, the cover, the dust cover and the carriage.

*b*) Dismount the addition and division keys and then the keyboard panel.

*c*) Take out the ribbon.

*d*) Clean the parts of the machine carefully with a brush.

e) Bring the vertical type racks to the nine position. With a nylon brush STAC 103 and the paste for the purpose, clean the type carefully. If necessary use a little gasoline but take care that absolutely no drops trickle into the interior of the machine.

*f*) When necessary proceed to the maintenance of the motor. Clean the manifold with the fibreglas for the purpose; the seats of the brush holders; the platinum points of the switch and the speed governor.

*g*) Lubricate at each overhaul with ST 440 oil:

— the support bushing of the main shaft with cam;
— the accumulator control cam N3 EH 105 and its roller **R** (figure 32);
— the slots of the main cam (figure 43) and the rollers of the lever N3 ER 9 and of the line spacing control lever N3 ET 36;
— the central pin of the motor link N3 FV 2 (figure 48) which acts on the double print control hook N3 T 31;
— the left handed thread stud 126503 of the slide return lever N3 EN 9 (figure 50). To oil the stud properly it is necessary to unscrew it for a few threads;
— the rear roller of the tens recharge bar control lever N3 ED 26 and the two slots where the pin **A** and the pin **P** are lodged (figure 50);
— the roller N3 N 12 (figure 52a) on which the spring leveller lever acts;
— the toothed wheels which transmit the movement to the main link (figure 53);
— the roller N3 V 6 (figure 53);
— the roller of the starter lever N3 EV 11 (figure 55) and the edge of the plate on which it acts;
— the roller of the lever N3 EH 24 (figure 66) which acts on the edge of the ovoid cam N3 GH 22;
— the bushing N3 Q 89 of the lever N3 GQ 87 (figure 72);
— the roller of the slide return lever N3 EN 9 which is engaged with the upper keyboard plate (figure 73);
— the roller **P** of the slide return lever N3 EN 9 (figure 85);
— the front roller of the plate N3 EN 1 which works on the slide return hook lever N3 EN 3 (figure 86). Also lubricate the collar head screw which guides the N3 EN 3;
— the pin **H** of the motor hook for the ovoid cam N3 EH 31 (figure 121);
— the roller N3 N 12 of the motor hook for the ovoid cam N3 EH 31 (figure 121);
— the roller $\mathbf{R}_1$ of the lever N3 EQ 31 which acts on the edge of cam N3 EQ 1 (figure 142);
— the roller **R** of the lever N3 EQ 1 which acts on the hook N3 Q 36 and on the lever N3 GQ 87 (figure 142);
— the pin 1263038 (figure 150) which guides the N3 M 248 at the back;
— the roller and pin of the motor arm N3 EM 35 (figure 161) which runs on the edge of the multiplier unit plate;
— the pin N3 M 29 fixed on the N3 EM 35 (figure 161);
— the roller of the N3 EM 73 (figure 164);
— the roller which positions the line spacing wheel.

*h*) Lubricate with ST 440 oil when necessary and at least once each three overhauls:

— the control lever N3 GQ 12 (figure 35) which acts on the control bridge N3 GQ 23;
— the roller N3 L 20 on the left lever for the universal bar N3 GR 8 (figure 42);

— the jaws N3 EL 18 engaged with the roller N3 L 20 (figure 42);
— the stud 126352 which guides the jaws N3 EL 18 (figure 42);
— the roller of the lever N3 ET 25 (figure 50) — the base plate must be removed;
— the shaft N3 T 26 (figure 50) — the base plate must be removed;
— the deflector **D** of the bracket N3 EH 110 (figure 62);
— the roller of the bracket N3 EV 15 (figure 73) which guides the slide in front;
— the rear pin of the line spacing control pull rod N3 GU 13 (figure 88);
— the back space control unit N3 EQ 17 (figure 92);
— the pin of the « 0 » key of the multiplier which acts on the bridge N3 M 21 (figure 158a);
— the rear roller of the N3 ET 131 (figure 254) and its hooking points;
— the pin **P** of the N3 H 136 which acts on the positioner N3 M 130 (figure 269);
— the pin which controls the movement of the jaws N3 EL 18;
— the pins of the ribbon advance teeth.

*i*) Check that the following parts are lubricated with ST 408 vaseline oil;
— the accumulator wheels;
— the vertical type racks gear pinions;
— the guide shafts of the hooks and transmission levers;
— the seats where the racks slide.

*l*) Check that the following parts are lubricated with ST 431 oil:
— the shaft of the slide;
— the entering and control key stems;
— parts which slide in general and which have not been mentioned specifically.

*m*) Replace the ribbon.

*n*) Replace the keyboard panel and the keys.

*o*) Replace the carriage, the dust cover, the cover and the hand knob.